21" CRT Colour Monitor Chassis: P72

Service
Service
Service

202P7

202P70/00
202P73/27
202P75/75
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202P75/97



Service Manual

Horizontal Frequencies
30 - 130KHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

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Important Safety Notice

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Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* *Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design.
Servicer assumes all liability.

** Broken Line*

FOR PRODUCTS CONTAINING LASER :

DANGER- Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

CAUTION- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION- The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

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1. ELECTRICAL SPECIFICATION

1.1. CRT

Type NR.	: M51QEQ991X001 (SDI DFT)
Dimensions	: 21"
AG Pitch	: 0.25mm
Deflection angle	: 90 deg
Light transmission	: 54.5 %
Surface of plate	: Spin coating (TCO & Anti static)
Phosphor	: P22
EHT	: 27.0 kV
Useful screen (mm)	: 406.4 X 304.8

1.2. Power supply

Main voltage	: AC 90 - 264Vrms, 47 - 63 Hz
Power consumption	: 125 Watts (typical)
Power cord length	: 1.8M
Power cord type	: 3 lead with earth plug, detachable
Power indicator	: LED (2 colors green, yellow).
Auto power saving	: Fulfill TCO 99 / TCO'03, EPA and E2000 requirements

Mode	H,	V	Video	power consumption	LED colors
ON	1	1	1	Normal	Green
OFF	0	1	X	< 1Watt	Yellow
OFF	1	0	X	< 1Watt	Yellow
OFF	0	0	X	< 1 Watt	Yellow

X : Video blanked.

1.3. Horizontal scan : 30 - 130kHz

1.4. Vertical scan : 50 - 160Hz

1.5. Input signals

1.Signal input level

Video : - 0.7 Vp-p Linear / 75 ohms

Sync : - H/H+V, V TTL level, composite sync,

- Analog SOG (Sync On Green) for models with SOG function.

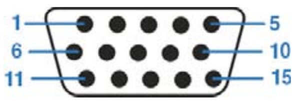
2.Impedance

Video : Terminated with 75 ohms

Sync : Terminated with 2K2 ohms

1.6. Input connectors

1. Pin assignment



Pin No.	Description
1	Red video input
2	Green video input (or Green video with Sync On Green input)
3	Blue video input
4	Id bit, Connected to pin 10
5	Ground, connected to pin 10
6	Red video ground
7	Green video ground
8	Blue video ground
9	+ 5V
10	Logic ground
11	Id bit, Connected to pin 10
12	Serial data line (SDA)
13	H/H+V Sync
14	V. Sync (VCLK for DDC)
15	Data clock line (SCL)

2. BNC input connectors (rear)

1	Red video input
2	Green video input (or Green video with Sync On Green input)
3	Blue video input
4	H/H+V sync
5	V sync

3. Signal interface

-Detachable, 1.5M 15Pins, pantone 661C color with icons D-sub male at both ends with DDC1/2B Pin assignments

2. Environmental conditions

2.1. Operating

-Temperature	: 5 to 35 °C
-Humidity	: 10 to 90 % (w/o condensation)
-Altitude	: 8,000ft

2.2. Storage

-Temperature C	: -40 to 60°
-Humidity	: 5% to 95% (w/o condensation)
-Altitude	: 39,000ft
- condensation	: should be prevented

3. Marking and identification

In accordance with UAN-D1109 and the approval marking required by the countries of destination.

4. Electrical characteristics and performance

4.1. Scanning:

4.1.1. Display mode :Auto-sync

4.1.2. Horizontal scanning

Sync polarity	:Positive or negative
Scanning frequency	:30 - 130 KHz

4.1.3. Vertical scanning

Sync polarity	:Positive or negative
Scanning frequency	:50 - 160 Hz

5.1.4.Rear porch of horizontal :>= 1 us

5.2. RGB amplifiers

Rise time/Fall time	: 4.0 ns / 4.0 ns
Video dot rate	: 355.03 MHz
Overshoot/undershoot	:Max. 12%
Black level shift	:Max. 3%
Sag	:max. 5%

5. Reliability

MTBF (Excluding the CRT) > 75,000 hrs (at 25 °)

5.1. Target field repair rate: < 2% during first 12 months

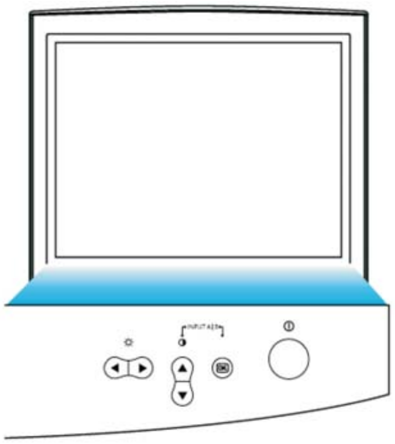
6. Quality

AQL	-- for	critical	failure	: 0 %
	-- for	major	failure	: 0.65 %
	-- for	minor	failure	: 2.5%

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Installation

Front View



Power button switches your monitor.

OK button which when pressed will take you to the OSD controls

Contrast hotkey. When the UP arrow is pressed,controls for the CONTRAST will show up.

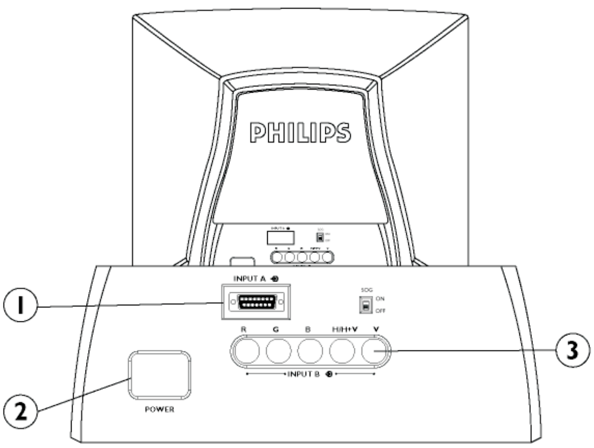
UP and DOWN buttons, are used for adjusting the OSD of your monitor.

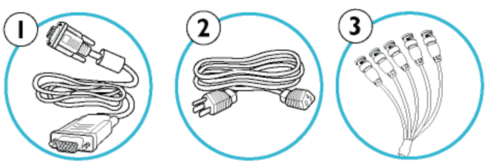
Brightness hotkey. When the RIGHT arrow is pressed, the adjustment controls for BRIGHTNESS will show up.

LEFT and RIGHT buttons, like the UP and DOWN buttons, are also used in adjusting the OSD of your monitor.

INPUT A/B By pressing both the UP and OK buttons, you can easily access the Input Signals A and/or B.

Rear View





1. S-Sub Port-Attach the D-Sub connector that comes with your monitor here. Other end connects to your PC.
2. Power in - Attach power cable here.
3. BNC Connectors - Attach the connectors here to get the best video performance from your monitor.

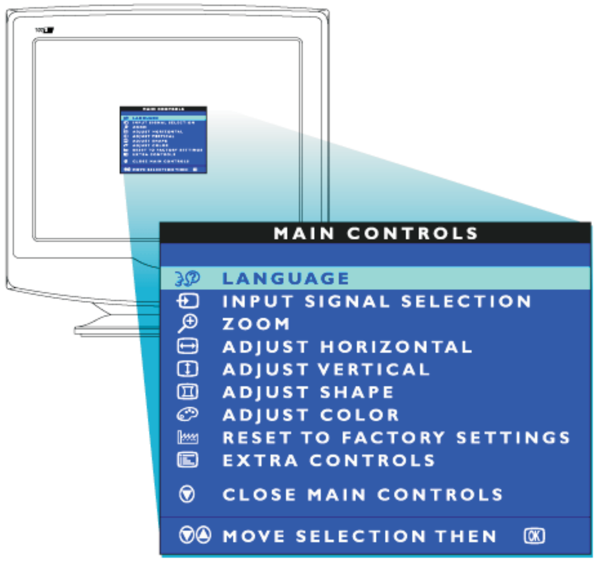
Description of the On Screen Display

What is the On Screen Display?

This is a feature in all philips monitors which allows an end-user to adjust screen performance of monitors directly through an on screen instruction on window. The user interface provides user-friendliness and ease-of-use when operating the monitor.

Basic and simple instruction on the control keys.

On the front controls of your monitor, once you press OK button, the On Screen Display (OSD) Main Controls window will pop up and you can now start making adjustments to your monitor's various features. Use the ◄ ► or the ▲ ▼ buttons to make your adjustments within.



1. General point

1.1 During the alignment and measurement supply a distortion free AC-mains voltage to the apparatus via an isolating transformer with a low internal resistance.

1.2 All voltages have to be measured or applied with respect to ground,unless otherwise stated.
Note: Don't use heatsink as ground.

1.3 The term "Linear RGB" is meant the 0.7Vpp video with separate sync. (TTL level).The factory preset timing formats from pattern generator "CHROMA- 2250" are shown in TABLE 1 to 36.

1.4 Any external voltage source should have low internal impedance.

1.5 The alignment has to be done in room temperature 25 ± 5 °C.

1.6 Digital control buttons for
OSD MENU:
- Language
  - -Language: multi-language (8 languages)
- Input
  - -Input signal selection
- Zoom
  - - Zoom
- Adjust horizontal
  - -Adjust position
  - -Adjust size
- Adjust vertical
  - -Adjust position
  - -Adjust size
- Adjust shape
  - -Adjust side curve
    - Pincushion
    - Balanced
  - -Adjust side angles
    - Trapezoid
    - Parallelogram
  - -Rotate image
    - Rotate
- Adjust color
  - -9300 °K for general use
  - -6500 °K for image management
  - -5500 °K for photoretouch
  - -sRGB
  - -Smart mode
  - -Professional mode
- Reset to factory settings
  - - No
  - -Yes
- Extra Controls
  - -Adjust moire
    - Horizontal
    - Vertical
  - -Degauss
  - -Adjust convergence
    - Horizontal
    - Vertical
  - -Adjust purity
    - NS purity
  - -Auto calibrate OFF AUTO

2. Pre warm-up

2.1 Align in pre-warmed condition at least 30 minutes during manufacturing.

2.2 Warm up the monitor by pushing power switch and OSD key

3. Main-chassis alignment

3.1 Power supply adjustment

3.1.1 To preset potmeter R3157 (B+) and R3698 (EHT) to center position.

3.1.2 Set VG2 (screen) to fully anti-clockwise (zero beam current).

3.1.3 To apply a 69KHz/85Hz cross hatch signal.

3.1.4 Adjust R3157 (B+) to obtain 230 V +/- 0.5 VDC across C2131.

4. H-deflection supply voltage adjustment

4.1 Apply a 69 kHz / 85Hz signal.

4.1.1 Adjust R3698 (EHT) to obtain 27.0 +/- 0.2kV at CRT anode at zero beam current for SDI 21" DFT tube. Glue fix the R3698VR.

4.1.2 Monitor the following auxiliary voltages.

+ 8.0V	SOURCE ACROSS C2362	+ 8.0V +/- 0.5 VDC
+ 5.0V	SOURCE ACROSS C2143	+ 5.0V +/- 0.5 VDC
+ 12.0V	SOURCE ACROSS C2361	+ 12.0V +/- 0.5 VDC
+ 15.0V	SOURCE ACROSS C2134	+ 15.1V +/- 1.0 VDC
- 15.0V	SOURCE ACROSS C2137	- 15.4V +/- 1.0 VDC
+ 6.3V	SOURCE ACROSS D6143	+ 6.1V +/- 0.5 VDC
+230.0V	SOURCE ACROSS C2131	+ 230.0V +/- 0.5 VDC
+ 80.0V	SOURCE ACROSS C2133	+ 82.0V +/- 2.0 VDC

5. General conditions for alignment

5.1 During all alignments, supply distortion free AC mains voltage to set via an isolating transformer with low internal impedance.

5.2 All measurements are carried out at nominal mains voltage, unless otherwise stated.

5.3 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.

5.4 Purity, convergence, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.
Northern hemisphere: H = 0, V = 430mG, Z = 0 .
Southern hemisphere: H = 0, V = - 520mG, Z = 0 .
Equatorial Support : H = 0, V = 0 mG, Z = 0.

5.5 All voltages are to be measured or applied with respect to ground,unless otherwise stated.
Note: Do not use heatsink as ground.

5.6 Any external voltage sources should have a low internal impedance.

5.7 Adjust function controls to center position except for contrast control which should be set to MAX.

5.8 The white balance and purity has to be adjusted in subducted lighted room.

5.9 All alignments have to be done in a room with a temperature of 25 +/- 5° C.

5.10 Adjust picture tilt for correct TOP/BOTTOM lines Via I2Cbus. (Picture tube should be mounted without tilt CRT cabinet)

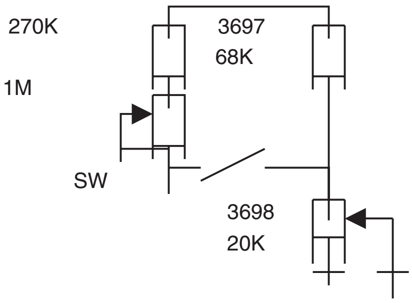
5.11 All the alignment can be done only when set is working in 'factory mode' - pressing the 'Right' and 'left' keys together while power on the test set, or by CAA test controller.
Prepare the test set in 'factory mode' before the set alignment.

6. X-ray protection adjustment

6.1 Set the brightness and contrast controls to minimum. Connect EHT meter
the high tension cap of CRT, set X-ray adj. R3695 to maximum activation voltage(fully clockwise, viewing from component side) and then turn on the set.

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One test circuit should be added to up high the EHT voltage during the adjustment:



Adjust 1Mohm pot-meter (decrease the resistance from Max position) gradually to Increase the EHT voltage to 29.0 KV and then slowly decrease the X-ray protection activation voltage by adjusting R3695 until the X-ray protection circuit is just activated.

Turn off the set and adjust 1Mohm pot-meter to maximum value and then re-start the power again.Re-test the X-ray protection by slowly increasing the EHT voltage (rotate 1Mohm pot-meter to smaller value) to confirm the X-ray protection activation voltage to be 29.0 KV ± 0.5KV, fix the R3695VR with silicon glue after passing re-test.

7. Alignment of VG2 cut-off, white tracking, auto calibration & Smart Mode

7.1 External degaussing

7.1.1 Remove ferromagnetic measuring equipment, Iron tablet etc in the neighbourhood of the apparatus within the half meter.

7.1.2 Positioned in the E - W direction (CRT face east), the monitor has to be degaussed by using external degaussing coil.

Remark: The external degaussing coil should be a stick type, can't use ring type for SDI DFT CRT, and set the electrical current of purity coils (N/S) equal to zero, which means the output of PWM 4 of 7204 (61P4K 420WT) equal to 128, or switch off the monitor before external degaussing.

7.1.3 Slowly increase the distance between the picture tube and degaussing coil, keep the coil in parallel with the screen of CRT when the distance is more than 2 M, then turn off the degaussing current.

7.1.4 Pre-check the purity by using "full RED pattern" after external degaussing, the user (OSD) control -"adjust purity" can be used to optimize the purity performance in pure RED, this action can help to achieve a correct white tracking adjustment.

7.1.5 Switch on the AUTO CALIBRATE function to "AUTO" in the EXTRA CONTROL item of OSD MAIN CONTROLS TABLE.

7.2 Apply 69KHz/85Hz with full white & 10cm X 10cm white patterns (video as 0.7Vpp) *Use color analyzer (Minolta CA-100) to adjust cutoff and white uniformity.

Preset (OSD control in the factory mode) following items with initial data (DAC value):

R cut off (BAIS) = 50% , R gain (GAIN) = 75%

G cut off (BAIS) = 50% , G gain (GAIN) = 75% sub contrast (SUB)= 70%

B cut off (BAIS) = 50% , B gain (GAIN) = 75% ABL = 50%

Remark: 100% = 255 steps, 60% = 153 steps, 50% = 128 steps, 75% = 191 steps, 70% = 179 steps.

7.2.1 Moving the OSD cursor to any one of R/G/B (BAIS), CPU software will set brightness control at 50% and contrast at minimum position when OSD cursor stays at BAIS items.

Measure the light output at center of the screen.

Rotate Vg2 to Minimum voltage.

Slowly increase Vg2 voltage until light output is at reading from 0.06 to 0.07Ft-L.

7.2.2 Adjusting the cut off of R & B to get 9300 °K (X= 0.283 ± 0.006, Y= 0.297 ± 0.006) and brightness output at reading from 0.06 to 0.07 Ft-L (may need to readjust the Vg2).(Apply a signal with 10cm X 10cm white pattern to test set.) * Keep G cut off with 128 (50%) DAC value during all alignments.

7.2.3 Move the cursor to 9300 °K R/G/B (GAIN) items.CPU software will set contrast to maximum when adjustment OSD cursor stays at GAIN items.

Adjust the gains of R/B to get 9300 °K (x=0.283, y=0.297).

7.2.4 Move the cursor to sub-contrast and adjust the brightness to 34 ±0.5 Ft-L.

7.2.5 Switch the input signal to full white pattern. Move the OSD cursor to ABL and adjust the output brightness to 32 ±0.5 Ft-L.

7.2.6 Repeat 7.2.2, 7.2.5 to get optimal adjustment (white tracking meet requirement ±0.015 with respect to center value) and return to main menu. After exit, the OSD will disappear and auto-save the data.

7.2.7 Repeat 7.2.2 to adjust 6500 °K 'cut off' to meet (X= 0.313 ± 0.006, Y= 0.329 ± 0.006).

7.2.8 Repeat 7.2.3 to adjust R/G/B 'GAIN' of 6500 °K to meet (x= 0.313, y= 0.329) and brightness output to 30±1 Ft-L.

7.2.9 Repeat 7.2.2 to adjust 5500 °K 'cut off' to meet (X= 0.332 ± 0.006, Y= 0.347 ± 0.006).

7.2.10 Repeat 7.2.3 to adjust R/G/B 'GAIN' of 5500 °K to meet (x= 0.332, y= 0.347) and brightness output to 27±1 Ft-L.

7.2.11 Repeat 7.2.2 to adjust sRGB 'cut off' to meet (x= 0.313 ± 0.006, y= 0.329 ± 0.006).

7.2.12 Repeat 7.2.3 to adjust R/G/B 'GAIN' of sRGB to meet (x= 313, y=329) and brightness output to 23±1 Ft-L.

7.3 Apply black pattern and check raster for just visible cut-off at brightness 50%.

7.4 Alignment result will be stored by UUT itself, after finish white balance adjustment.

7.5 Alignment of Auto calibration

7.5.1 After finish the white balance adjustment, select the 9300K in OSD ADJUST COLOR,enable & select the AUTO CALIBRATE in OSD item - EXTRA CONTROL, press the OK key pad to do the auto calibration measurement, store the beam current values.

7.5.2 Repeat the procedure in 7.5.1 to measure and store the beam current values in 6500K,5500K and sRGB.

Notes : Beam current measuring and white balance adjustment can be done by command from CAA alignment Program (according to software approval Sheet 140,139).

7.5.3 Switch on (AUTO) the auto calibration function after finish all alignment items.

7.6 Smart Mode color adjustment - This process only can be taken by CAA test program.

7.6.1 CAA takes the 6500 °K 'cut off' and R-gain DAC values as a reference and keep them fixed to proceed others color temperatures .

adjustment for Smart mode color once it finished the 6500° K from 7.2.1 to 7.5.2 .CAA re-adjusts the 5500° K & 9300° K then adjusts 4000° K, 4600° K and 8000° K, figures out the necessary 2 groups (one for G-gain, one for B-gain) of 1 constant and 3 coefficients data by these adjustments and writes it into EEprom via MCU of the monitor under tested, the address A0 page 0xF0 to 0xF7 store the G-gain data, 0xF8 to 0xFF store the B-gain data. The MCU of monitor will perform the SmartMode color by these data.

8. Adjustment of the picture geometry

8.1 EEprom data has to be preset data according to software approval sheet.Sheet 139, sheet 140. Pre-set data please refer: TIMING TABLE 1 to 36

Note: The EEprom should be loaded beforehand with average values of mode preset data and mode preset selection bytes. This preload data should be collected by EPE from product batch by batch to keep the entire image of all preload modes display inside the bezel with the a specification of H-width: 392mm±10 mm and V-size: 294mm±10mm.

8.1.1 Preload the default DAC value into following listed items-

Item	DAC Value	Remark
FOCUS H / V	0 / 200	Default
VLINBAL	85	Default
USER H-Range	64	Specified
RASTER H / V	160 / NU	Default
LIN H / V	* / 223	Default
SUB⊕ (ZOOM -Range)	64	Specified
V OFFSET / GAIN	150 / 200	Specified
D convergence	0	Default
NS Purity	127	Specified
CORNER TOP/BOTTOM	105 / 95	Default
BAIS LIMIT	153	Specified

Remark: Default - EPE has to correct these values batch by batch to achieve best product FOS.

Specified - These values should be kept no change for the production, Dev has the Responsibility to check and modify with the proper values.

H-linearity default setting

	Freq. Range KHz	Resolution @Hz	DAC Value	
1	~33.0	720*400 @ 70.0	85	
2	33.0~36.0	800*600 @ 35.2	100	
3	36.0~42.0	640*480 @ 75.0	105	
4	42.0~45.0	640*480 @ 85.0	120	
5	45.0~47.5	800*600 @ 75.0	120	
6	47.5~49.0	1024*768 @ 60.0	125	
7	49.0~52.0	832*624 @ 74.5	125	
8	52.0~55.0	800*600 @ 85.0	135	
9	55.0~58.5	1024*768 @ 70.0	135	
10	58.5~61.5	1024*768 @ 75.0	140	
11	61.5~65.0	1280*1024 @ 60.0	140	
12	65.0~70.0	1024*768 @ 85.0	150	
13	70.0~73.0	1125*900 @ 76.0	155	
14	73.0~76.0	1600*1200 @ 60.0	155	
15	76.0~80.6	1152*864 @ 85.0	165	
16	80.6~82.5	1600*1200 @ 65.0	165	
17	82.5~84.8	1792*1344 @ 60.0	165	
18	84.8~88.5	1600*1200 @ 70.0	165	
19	88.8~92.5	1280*1024 @ 85.0	175	
20	92.5~98.0	1600*1200 @ 75.0	175	
21	98.0~102.0	1600*1200 @ 80.0	175	
22	102.0~110.0	1792*1344 @ 75.0	175	
23	110.0~113.5	1920*1440 @ 75.0	180	
24	113.5~122.0	2048*1536 @75.0	170	
25	122.0~126.5	1856*1392 @ 85.0	185	
26	126.5~	1920*1440 @ 85.0	185	
27	130	2048*1536@80.0	185	

8.2 Alignment of horizontal and vertical geometry.

8.2.0 Enable the MAGNETIC function in the MODEL SELEC (factory mode OSD).

8.2.1 Apply the timing mode 2048x1536 120kHz 75Hz (timing table 35), pattern FIG.1 to FIG.4 to set under tested. Correct the test image to display in parallel with front top plastic bezel by adjusting the Rotate item in OSD Adjust shape. Repeatedly do the adjustments from 8.2.2 to 8.2.13 to correct the geometry of this mode and fix the position of horizontal raster on display screen.

8.2.2 Adjust Raster H (in factory mode) to make the horizontal raster symmetrical display at center of the screen.

8.2.3 Adjust the H-Width to 392mm.

8.2.4 Adjust the H-linearity to get optimum horizontal deflection linearity display block to block.

8.2.5 Adjust the H-Phase to center position.

8.2.6 Adjust the side curve - Pincushion & Balance to get optimum right vertical lines.

8.2.7 Adjust the side angles - Trapezoid & Parallelogram to get optimum right vertical lines.

8.2.8 Adjust the Corner Top & Bottom to get optimum right vertical lines.

8.2.9 Adjust the Vertical size to 294 mm.

8.2.10 Adjust the vertical linearity to get optimum vertical deflection linearity display block to block.

8.2.11 just the Vertical phase to center.

8.2.12 epeatedly do the adjustments from 8.2.3 to 8.2.11 to optimize the geometry performances and meet the specification (sheet 161) request.

8.2.13 Exit OSD and auto saves the alignment data.

8.2.14 Repeat the procedure of 8.2.2 - 8.2.13 to all inspection (preset) & alignment modes listed in the following Factory timing modes table (total 11 modes) until all have been adjusted completely.

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Factory timing modes table

Timing table No.	Horizontal frequency KHz	Vertical frequency Hz	Resolution	Remark
1	31.469	59.941	640x480	Preload mode
2	31.469	70.087	720x400	Preload mode
3	37.500	75.000	640x480	Preload mode
4	37.861	72.809	640x480	Preload mode
5	37.879	60.317	800x600	Preload mode
6	43.269	85.008	640x480	Preload mode
7	46.875	75.000	800x600	Preload mode
8	48.077	72.188	800x600	Preload mode
9	48.363	60.004	1024x768	Alignment mode for preloading
10	49.725	74.550	832x624	Preload mode
11	50.600	100.100	640x480	Preload mode
12	53.674	85.061	800x600	Preload mode
13	56.476	70.069	1024x768	Preload mode
15	60.023	75.029	1024x768	Inspection mode 1
16	63.900	100.100	800x600	Preload mode
17	63.981	60.020	1280x1024	Preload mode
18	68.667	84.997	1024x768	Inspection mode 2
19	68.681	75.062	1152x870	Preload mode
22	75.000	60.000	1600x1200	Preload mode
23	79.976	75.025	1280x1024	Inspection mode 3
24	81.250	65.000	1600x1200	Preload mode
25	83.640	60.000	1792x1344	Preload mode
27	86.333	59.995	1856x1392	Preload mode
28	87.500	70.000	1600x1200	Preload mode
29	90.000	60.000	1920x1440	Preload mode
30	91.146	85.024	1280x1024	Inspection mode 4
31	93.750	75.000	1600x1200	Inspection mode 5
32	106.250	85.000	1600x1200	Inspection mode 6
33	106.270	74.997	1792x1344	Inspection mode 7
34	112.500	75.000	1920x1440	Inspection mode 8
14	119.935	85.000	1792x1344	Preload mode
35	120.450	75.000	2048x1536	Alignment mode for fixing the position of H raster
26	120.560	80.000	1792x1344	Preload mode
20	124.185	85.000	1856x1392	Preload mode
21	128.520	85.000	1920x1440	Inspection mode 9
36	130.000	80.000	2048x1536	Preload mode

Remark: The alignment result DAC values mentioned in following items (8.2.15 to 8.2.21)are pincushion, balanced, trapezoid, parallelogram, corner top and corner bottom.

8.2.15 Copy the alignment result DAC values of alignment mode timing table No. 9 into preload mode timing table No. 8, 7, 6, 5, 4, 3, 2 and 1.

8.2.16 Copy the alignment result DAC values of inspection mode timing table No. 15 into preload mode timing table No. 13, 12, 11and 10.

8.2.17 Copy the alignment result DAC values of inspection mode timing table No. 18 into preload mode timing table No. 17 and 16.

8.2.18 Copy the alignment result DAC values of inspection mode timing table No. 23 into preload mode timing table No. 22 and 19.

8.2.19 Copy the alignment result DAC values of inspection mode timing table No. 30 into preload mode timing table No. 29, 28, 27, 25, and 24.

8.2.20 Copy the alignment result DAC values of alignment mode timing table No. 35 into preload mode timing table No. 14.

8.2.21 Copy the alignment result DAC values of inspection mode timing table No. 21 into preload mode timing table No. 20, 26 and 36.

8.2.22 Fill up all alignment result DAC values with FF (hex-decimal) into 16 new modes. (addresses in EEprom A2 page 80H to C7H & A4 page 00H to FFH, refer to sheet-140 18 of 30 & 19 of 30.)

9. Focus adjustment

9.1 Apply "ME" pattern shown at FIG-7 with timing 91.146 KHz 1280 X 1024 / 85Hz. Set brightness at 50% and contrast 100% at the center of the screen.Preload the DAC values of H-focus to 0 and V-focus to 185 in the factory mode.

Adjust focus potmeters (F1& F2) which are located on fly-back transformer together with OSD V-focus (dynamic) in factory mode, until the haze just disappear on 2/3 east and west, top and down of the screen.

After the adjustment the focus performance should be confirmed at higher resolution mode - 106.5KHz/85Hz 1600X1200.

10. ADJUSTMENT AND TOUCH-UP FOR MISCONVERGENCE

Apply a cross-hatch pattern @ 69kHz/85Hz, adjust the H- convergence and V-convergence to get the best static convergence. Although CRT makers provide the CRT with mis-convergence 0.25 mm or better in zone A, and 0.35mm or better in zone B (see Fig.6), the static convergence varies with focusing location or deviation from chassis,slight correction is sometimes required for static convergence to meet required product specification (same as Fig.6). This correction is to be made by re-adjusting the multi-pole magnets or some controls on the CRT yoke to get the best convergence at the center of the screen. Some spoilers may be added to improve some local mis-convergence.

11. PRESET FOR MOIRE CONTROL

For horizontal moire functions, the preset value should be adjusted to '0' to all 36 preset and preload modes.

12 Loading DDC code

The DDC HEX data (refer sheet 190) should be written into the IC 7336 via MCU(7301), or DDC IC (7491) optionally by EEPROM writer or equivalent method.

13 justment of purity

To place the monitor face east @ magnetic field as 5.4 described, and set the user control value of the N/S to 50%, apply a full red (or 5-mosaic red) pattern with standard display size @ 69kHz / 85Hz mode, the monitor should be degaussed well before adjustment, the degaussing method should accord to 7.1.2 described if external degaussing is necessary, then use a landing meter LND-070 or equivalent to adjust the purity to get best landing 0 +/- 2 micrometers.

0. General
To be able to perform measurements and repairs on the "circuit boards", these unit should placed in the service position first.

1. Remove the rear cover in Fig. 1 and Fig. 5.
-Remove 4 screws as shown Fig.1
-Remove pedestal as shown Fig.1
-Remove 2 clips as shown Fig.2
-Remove 2 screws as shown Fig.3
-Remove back cover as shown Fig.4
-Remove 21 screws and remove Shied bottom assy as shown Fig.4
-Remove 2 screws as shown Fig.5

2. Video panel
-Disconnect the wire between metal shield of video panel and CRT neck as shown in Fig. 6.
-Disconnect the CRT grounding from Video panel.
-Remove and grounding wire in Fig. 6.

3. Main board connector in Fig. 7.
-Disconnect york wire
-Disconnect rotation connector
-Disconnect control board connector
-Remove Screw for fixed I/F cable
-Remove signal connector
-Remove degaussing wire connector

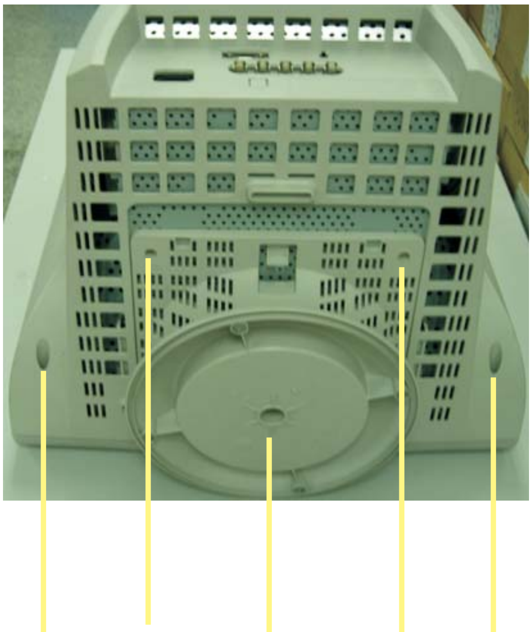


Fig. 1



Fig. 2

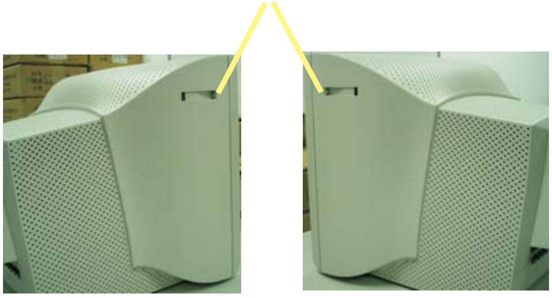


Fig. 3

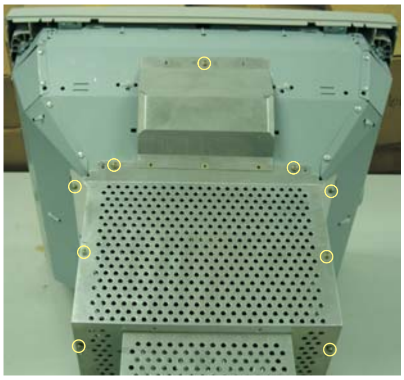


Fig. 4

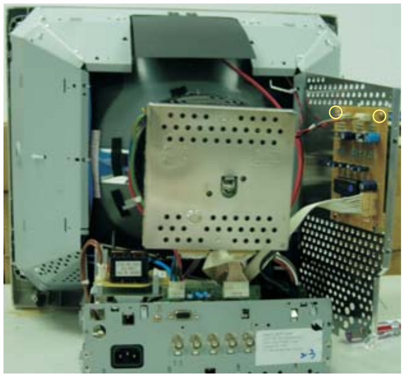


Fig. 5

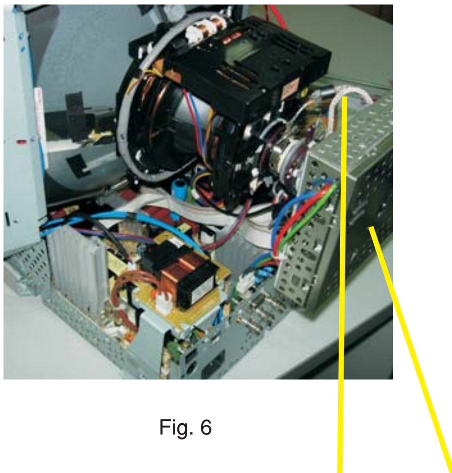


Fig. 6

Go to cover page



Fig. 7

4. Main panel with Bottom Tray
-Remove 4 screws for disconnect the Bottom tray as Fig. 8.
-Remove the bottom tray on press right and left side clip from fig. 8 to fig. 9.

5. SERVICE POSITION
-reconnect connectors, some wires and panels (chassis), service position can be available for DC/AC measurement as shown in Fig. 9.

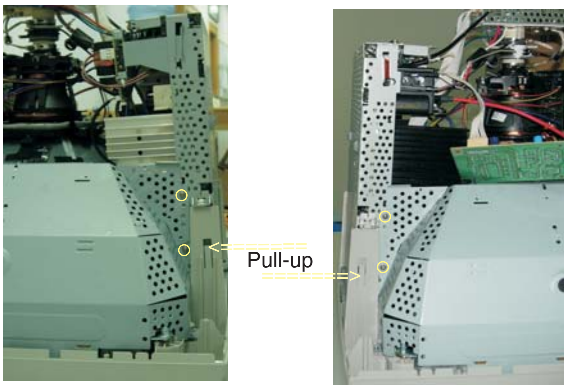


Fig. 8

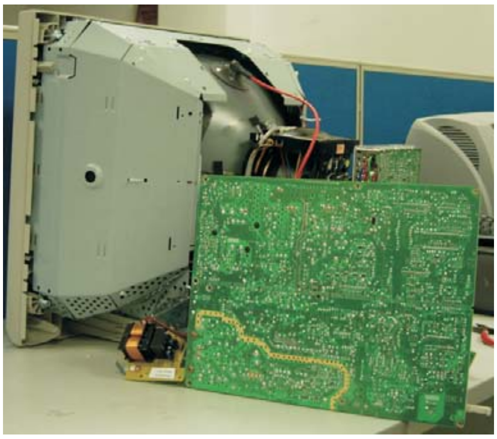


Fig. 9

Troubleshooting

The following table lists possible common problems, and the recommended resolution.

Having this problem?	Check these items
No picture (Power LED not lit)	•Make sure the Power cable is plugged into the power outlet and back of the monitor. •Power button on the front of your monitor should be in the ON position. •Disconnect the monitor from the power outlet for about one minute.
No Picture (Power LED is yellow)	•Make sure the computer is turned on. •Make sure the monitor cable is properly connected to your computer. •Check to see if the monitor cable has bent pins. •The Energy Saving feature may be activated
No Picture (Power LED is green)	•Make sure the Brightness and Contrast controls are set correctly. •Make sure the monitor cable is properly connected to your computer. •Check to see if the monitor cable has bent pins. •Make sure the computer Power button is on.
Screen doesn't show when you turn on the monitor	•Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Start Guide). •Check to see if the monitor cable has bent pins. •Make sure the computer is turned on.
No color or intermittent color	•If you are using a non-VESA-DDC standard video card, turn the DDC1 / 2B feature Off.
Color appears blotchy	•The picture may need degaussing. •Remove any nearby magnetic objects. •Face the monitor toward the East for the best picture quality.
Missing one or more colors	•Check the Color Temperature. •Make sure the monitor cable is properly connected to your computer. •Check to see if the monitor cable has bent pins.
Dim Picture	•Adjust the Brightness and Contrast controls. •Check your video card and it's owner's manual instructions for it may be a non-VESA-DDC Standard card.
Picture is too large or too small.	•Adjust the Horizontal and/or Vertical Size. •Adjust the Zoom.
Edges of the picture are not square.	•Adjust the geometry.
Picture has a double image.	•Eliminate the use of a video extension cable and/or video switch box. •Face the monitor toward the East for the best picture quality.
Picture is not sharp.	•Check to make sure Moire is switched off. •Adjust Sync Input.
Unstable Picture	•Increase your refresh rate.
Problem with On Screen Display	•Refer to the instructions and troubleshooting information in that chapter.

OSD Adjustments

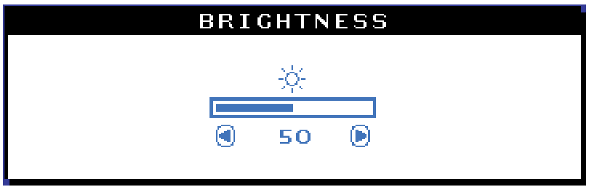
Go to cover page

The OSD Controls

BRIGHTNESS

To adjust your screen's brightness, follow the steps below. Brightness is the overall intensity of the light coming from the screen. A 50% brightness is recommended.

1) Press the or button on the monitor. The BRIGHTNESS window appears.



2) Press the or button to adjust the brightness.

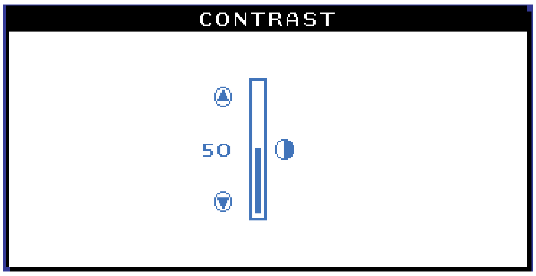
3) When the brightness is adjusted to the level desired. Stop pressing the or button and after three seconds the BRIGHTNESS window will disappear with the new adjustment saved.

Smart Help After the BRIGHTNESS window has disappeared, to continue to the CONTRAST window, follow the steps under CONTRAST.

CONTRAST

To adjust your screen's contrast, follow the steps bellow. Contrast is the difference between the light and dark areas on the screen. A 100% contrast is recommended.

1) Press the or button on the monitor. The CONTRAST window appears.



2) Press the or button to adjust the contrast.

3) When the contrast is adjusted to the level desired, stop pressing the or button and after three seconds the CONTRAST window will disappear with the new adjustment saved.

Smart Help After the CONTRAST window has disappeared, to continue to the MAIN CONTROLS, follow the steps under LANGUAGE.

LANGUAGE

The ON SCREEN DISPLAY shows its setting in one of eight languages. The default is English, but you can select French, Spanish, German, Italian, simplify-Chinese, Korea or Portuguese.



1) Press the button the monitor. The MAIN CONTROLS window appears. LANGUAGE should be highlighted.

2) Press the button again. The LANGUAGE window appears.
3) Press the or button until the desired language is highlighted.



4) press the button to confirm your selection and return to MAIN CONTROLS window. Close MAIN CONTROLS will be highlighted...

Smart Help After returning to MAIN CONTROLS......to continue to INPUT SIGNAL SELECTION,press the button until INPUT SIGNAL SELECTION is highlighted. Next, follow step 3-5 under INPUT SIGNALSELECTION .

......to exit completelly,press the button

INPUT SIGNAL SELECTION (Not available in all models)

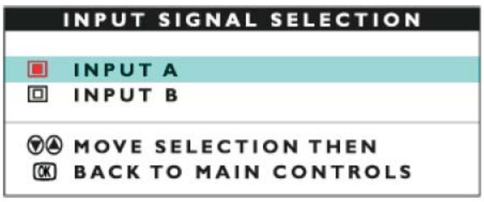
INPUT SIGNAL SELECTION determines what you see on the screen. The default setting is INPUT A, but if the video input signal is different that the output signal, you may want to change it to INPUT B.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until INPUT SIGNAL SELECTION is highlighted.



3) Press the button. The INPUT SIGNAL SELECTION window appears.



4) Press the or button to highlight INPUT B or INPUT A.
5) Press the button to confirm your selection and return to the MAIN CONTROLS window.CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...
... To continue to ZOOM, press the button until ZOOM is highlighted. Next, follow steps 3-5 under ZOOM.

...To exit completely, press the button.

ZOOM

ZOOM increase or decrease the size of the images on your screen. To adjust the ZOOM follow the steps below.

1) Press the button on the monitors. The MAIN CONTROLS window appears.

2) Press the button until ZOOM is highlighted.

3) Press the button. The ZOOM window appears.



4) Press the or button to adjust ZOOM.

5) Press the button to confirm your selection and return to the MAIN CONTROLS window. Close MAIN CONTROLS will be highlighted.

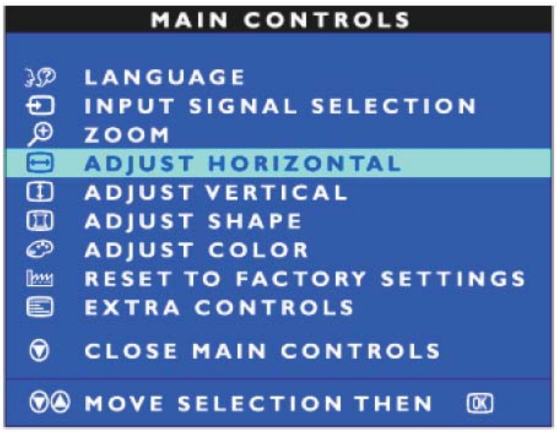
Smart Help After returning to MAIN CONTROLS...
... to continue to ADJUST HORIZONTAL, press the button until ADJUST HORIZONTAL is highlighted. Next, follow steps3-7 under ADJUST HORIZONTAL.
... To exit completely, press the button.

ADJUST HORIZONTAL

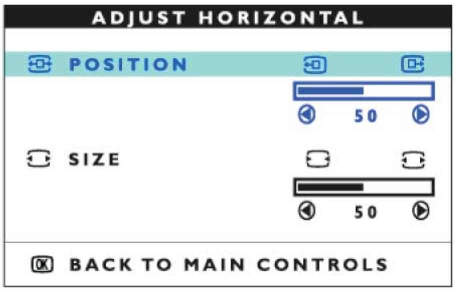
ADJUST HORIZONTAL under ADJUST HORIZONTAL shifts the image on your screen either to the left or right. Use this feature if your image does not appear centered. ADJUST SIZE under ADJUST HORIZONTAL expands or controls the image on your screen, pushing it out toward the left and right sides or pulling it in toward the center.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until ADJUST HORIZONTAL is highlighted.

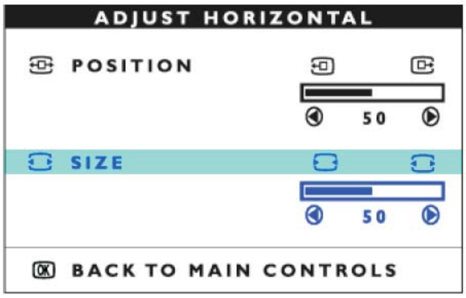


3) Press the button. The ADJUST HORIZONTAL window appears. ADJUST POSITION should be highlighted.



4) Press the or button to move the image to the left or right.

5) When the position is adjusted, press the button to return to MAIN CONTROLS window, or press the to highlight ADJUST SIZE.



6) To adjust the horizontal size, press the or button.

7) When the size is adjusted, press the button to return to MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...
... To continue to ADJUST VERTICAL, press the button until ADJUST VERTICAL is highlighted. Next, start with step 3 under ADJUST VERTICAL and follow the directions.
...To exit completely, press the button.

ADJUST VERTICAL

ADJUST POSITION under ADJUST VERTICAL shifts the image on your screen either up or down. Use this feature if your image does not appear centered. ADJUST VERTICAL expands or controls the image on your screen, pushing it out toward the top or bottom or pulling it in toward the center.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

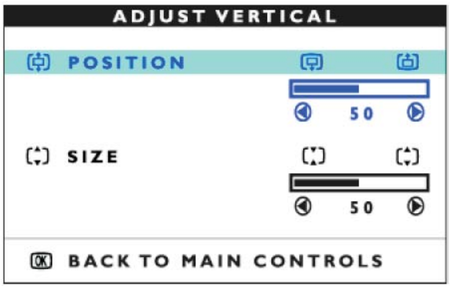
2) Press the button until ADJUST VERTICAL is highlighted.



3) Press the button. The ADJUST VERTICAL window appears. ADJUST POSITION should be highlighted.

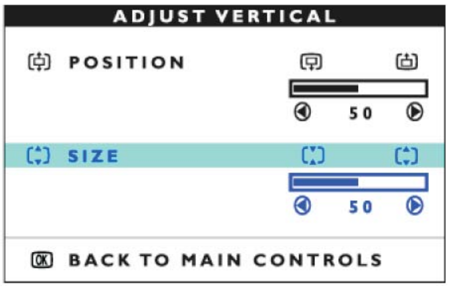
OSD Adjustments (Continued)

Go to cover page



4) Press the or button to move the image up or down.

5) When the position is adjusted, press the button to return to MAIN CONTROLS window, or press the button to highlight ADJUST SIZE.



6) To adjust the vertical size, press the or button.

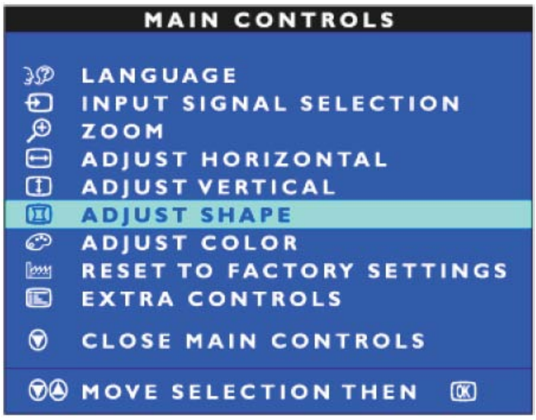
7) When the size is adjusted, press the button to return to MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...
... To continue to ADJUST SHAPE, press the button until ADJUST SHAPE is highlighted. Next, start with step 3 under ADJUST SHAPE and follow the directions.
... To exit completely, press the button.

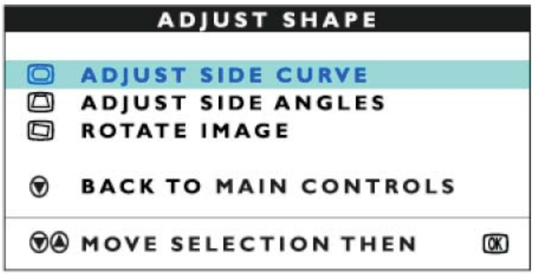
ADJUST SHAPE
ADJUST SIDE CURVE
ADJUST SIDE CURVE under ADJUST SHAPE allows you to adjust two of the five preset options. These two options are PINCUSHION and BALANCED pincushion. Note: use these features only when the picture is not square.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

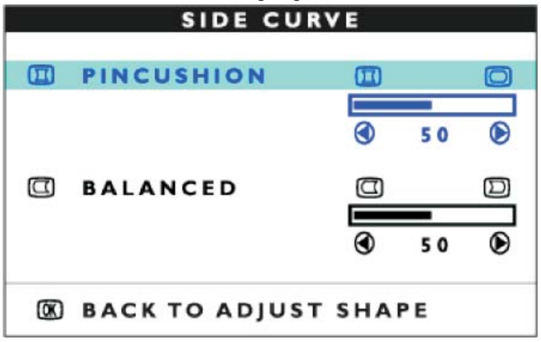
2) Press the button until ADJUST SHAPE is highlighted.



3) Press the button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.

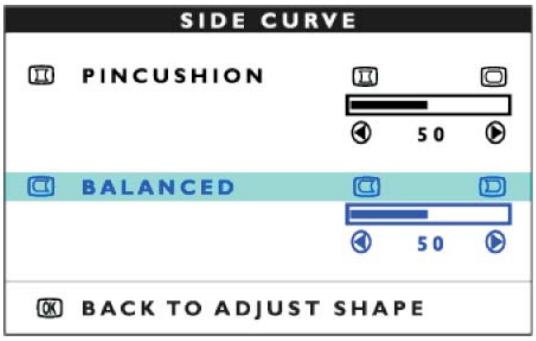


4) Press the button. The SIDE CURVE window appears. PINCUSHION should be highlighted.



5) To adjust the pincushion, press the or button.

6) When the pincushion is adjusted, press the button to highlight BALANCED or press the button to return to the ADJUST SHAPE window.



7) To adjust the balanced, press the or button.

8) When the balanced is adjusted, press the button. BACK TO ADJUST SHAPE will be highlighted.

9) Press the button to return to the ADJUST SHAPE window, then press the button until ADJUST SIDE ANGLES is highlighted.

Smart Help After returning to MAIN CONTROLS...
... To continue to ADJUST SIDE ANGLES, start with step 5 under ADJUST SIDE ANGLES and follow the directions.

...To exit completely. Press ie button twice.
... to adjust only the BALANCED pincushion,follow steps 1-4 above, then press the button,and follow steps 7-9.

ADJUST SIDE ANGLES

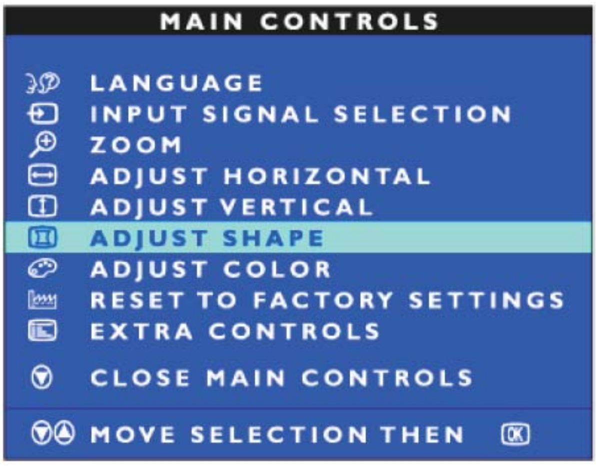
ADJUST SIDE ANGLES under ADJUST SHAPE allows you to adjust two of the five preset options. These two options are TRAPEZOID and PARALLELOGRAM. Note: use these features only when the picture is not square.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

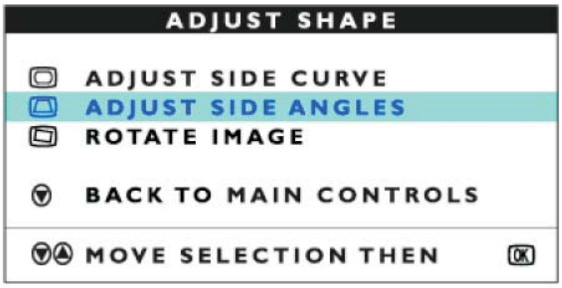
2) Press the button until ADJUST SHAPE is highlighted.

Go to cover page

OSD Adjustments (Continued)

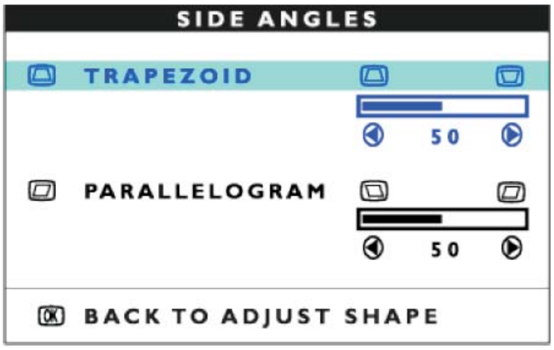


3) Press the button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.



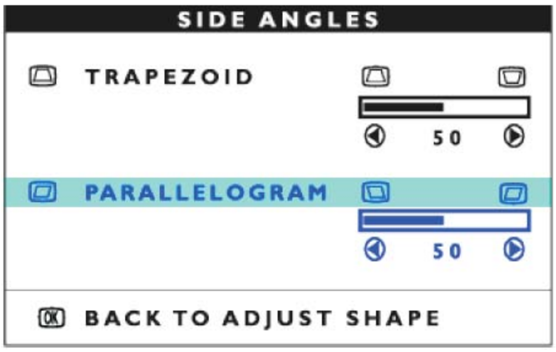
4) Press the button to highlight ADJUST SIDE ANGLES.

5) Press the button. The SIDE ANGLES window appears. TRAPEZOID should be highlighted.



6) To adjust the trapezoid, press the or button.

7) When the trapezoid is adjusted, press the button to highlight PARALLELOGRAM or press the button to return to the ADJUST SHAPE window.



8) To adjust the PARALLELOGRAM, press the or button.

9) When the parallelogram is adjusted, press the button to return to the ADJUST SHAPE window. BACK TO MAIN CONTROLS window will be highlighted.

10) Press the button to return to the MAIN CONTROLS window, or press the button until ROTATE IMAGE is highlighted.

Smart Help After returning to MAIN CONTROLS...
... To continue to ROTATE IMAGE, start with step 5 under ROTATE IMAGE and follow the directions.

...To exit a completely, press the button twice.

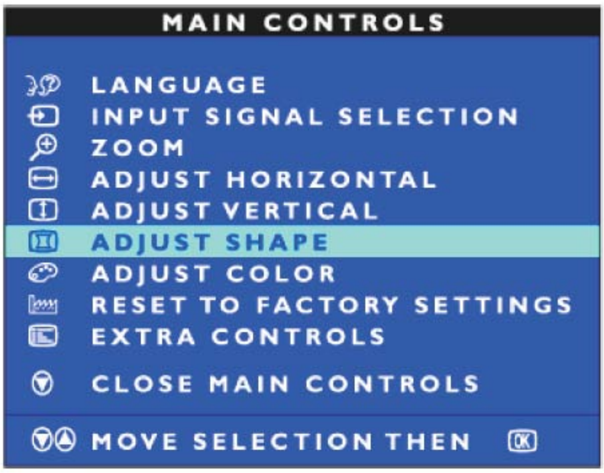
...To adjust only the PARALLELOGRAM, follow steps 1-4 above, then press the button, and follow steps 7-9

ROTATE IMAGE

ROTATE IMAGE under ADJUST SHAPE allows you to adjust the rotated image. Note : use this feature only when the picture is not square.

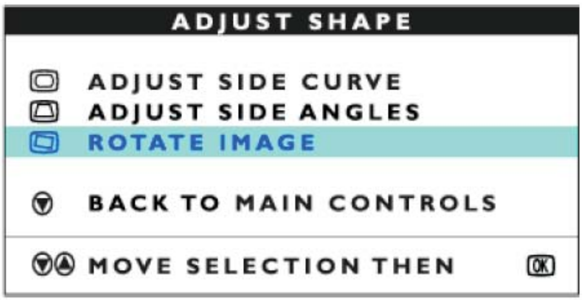
1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until ADJUST SHAPE is highlighted.



3) Press the button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.

4) Press the button until ROTATE IMAGE is highlighted.

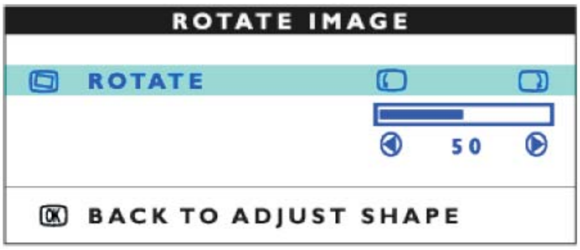


5) Press the button. The ROTATE IMAGE window appears. ROTATE will be highlighted.

6) To adjust the rotation, press the or button.

OSD Adjustments (Continued)

Go to cover page



7) When the rotation is adjusted, press the button to return to the ADJUST SHAPE window. BACK TO MAIN CONTROLS should be highlighted.

8) Press the button to return to MAIN CONTROLS.

Smart Help After returning to MAIN CONTROLS...
... To continue to ADJUST COLOR, press the button until ADJUST COLOR is highlighted. Next, start with step 3 under ADJUST COLOR and follow the directions.

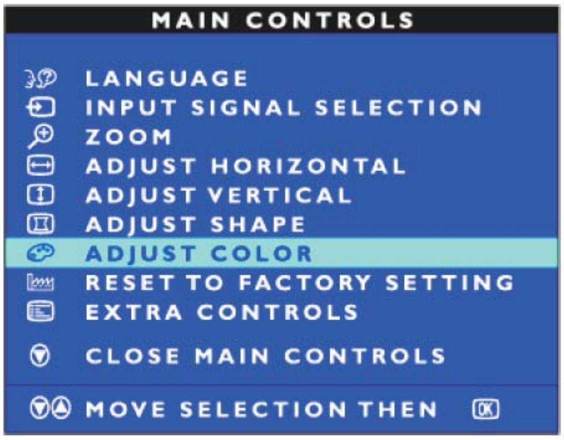
... To exit completely, press the button twice.

ADJUST COLOR

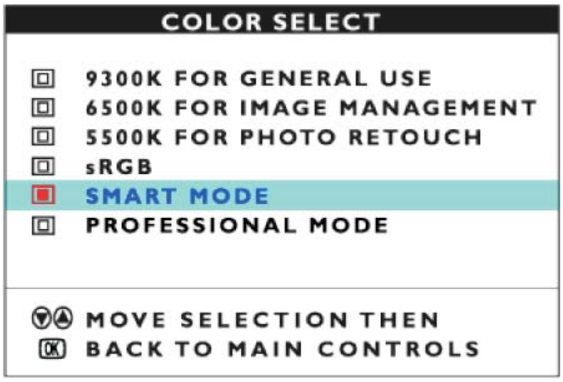
Your monitor has three preset options you can choose from. The first option is for GENERAL USE,which is fine for most applications. The second option is for IMAGE MANAGEMENT, which includes projects such as desktop publishing, viewing a DVD from your DVD player or pictures on the World Wide Web, and playing video games. The third option is for PHOTO RETOUCH, which is for working with pictures you have imported into your computer and want to alter. The fifth option is for sRGB, which provides standard sRGB color performance to match another sRGB output. When you select one of these options, the monitor automatically adjusts itself to that option. There are also two options, smart model and professional model, which allows you to adjust colors on your screen to a setting you desire for high-end application.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until ADJUST COLOR is highlighted.



3) Press the button. The ADJUST COLOR window appears.



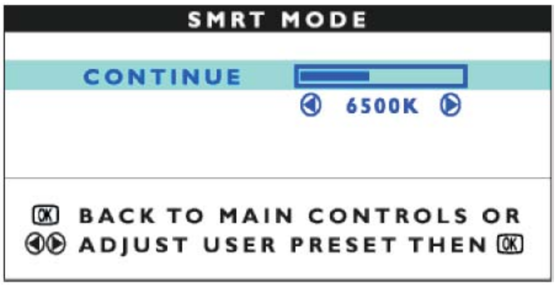
4) Press the or button to highlight 9300K for GENERAL USE. 6500K for IMAGE MANAGEMENT,5500K for PHOTO RETOUCH, USER PRESET or sRGB.

5) Once you have highlighted the GENERAL USE, IMAGE MANAGEMENT, PHOTO RETOUCH or sRGB, press the button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

6a) Press the or button to highlight SMART MODEL.

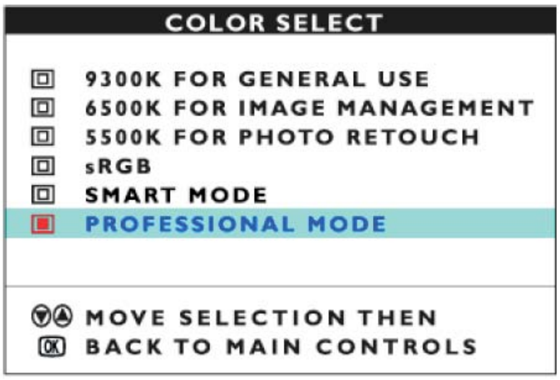
6b) Once you have highlighted SMART MODEL press the button to confirm your selection.

6c) Press the or button to adjust the color temperature. (Adjustment range 4000K-10000K)



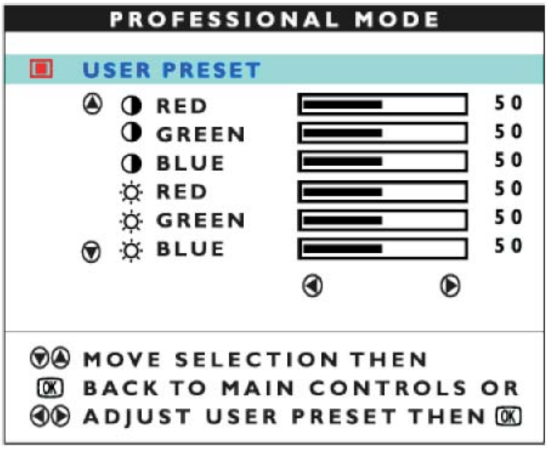
6d) When adjustments is complete, press the button to confirm your adjustments and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

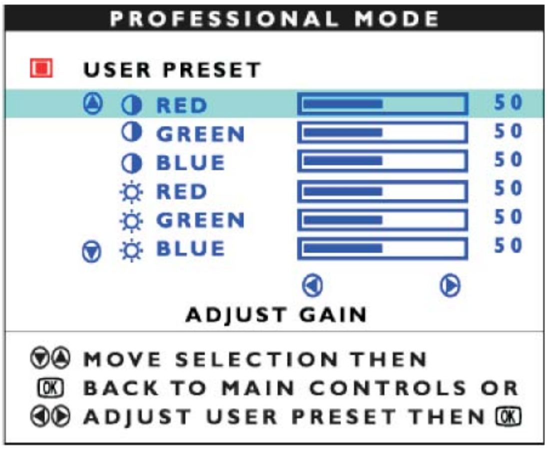
7a)Press the or button to highlight PROFESSIONAL MODEL.



7b) USER PRESET is highlighted, press the button to highlight RED GAIN. Next, press the or button to adjust the color red gain.

Go to cover page

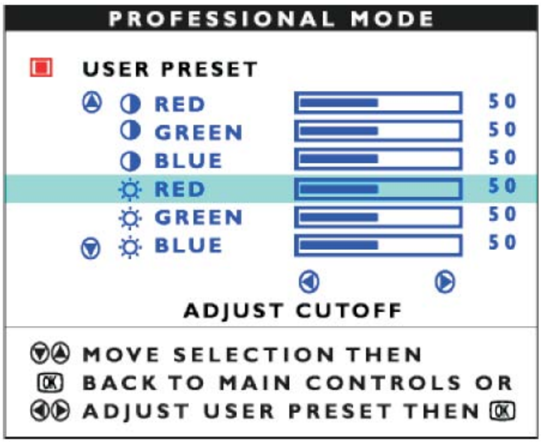




7c) When finished with RED GAIN, press the button to highlight GREEN GAIN. Next, press the or button to adjust the color green gain.

7d) When finished with GREEN GAIN, press the button to highlight BLUE GAIN. Next, press the or button to adjust the color blue gain.

7e) When finished with BLUE GAIN, press the button to highlight RED CUTOFF. Next, press the or button to adjust the color red cutoff.



7f) When finished with RED CUTOFF, press the button to highlight GREEN CUTOFF. Next,press the or button to adjust the color green cutoff.

7g) When finished with GREEN CUTOFF, press the button to highlight BLUE CUTOFF. Next,press the or button to adjust the color blue cutoff.

7h) When all adjustments are complete, press the button to confirm your adjustments and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS. . .

. . . to continue to RESET TO FACTORY SETTINGS, press the button untilRESET TO FACTORY SETTINGS is highlighted. Next, start with step 3 underRESET TO FACTORY SETTINGS.

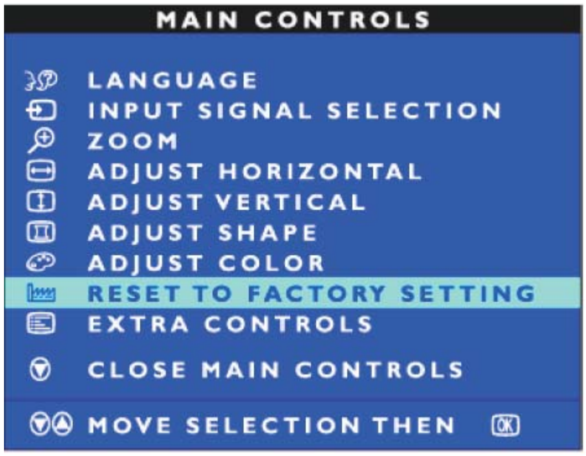
. . . to exit completely, press the button.

RESET TO FACTORY SETTINGS

RESET TO FACTORY SETTINGS returns everything in all the windows to factory presets.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until RESET TO FACTORY SETTING is highlighted.



3) Press the button. The RESET TO FACTORY SETTINGS window appears.

4) Press the or button to select YES or NO. NO is the defaults. YES return all settings to their original factory adjustments.



5) Press the button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... To continue to EXTRA CONTROLS, press the button until EXTRA CONTROLS is highlighted. Next, start with step 3 under EXTRA CONTROLS.

...To exit completely, press the button.

EXTRA CONTROLS

ADJUST MOIRE

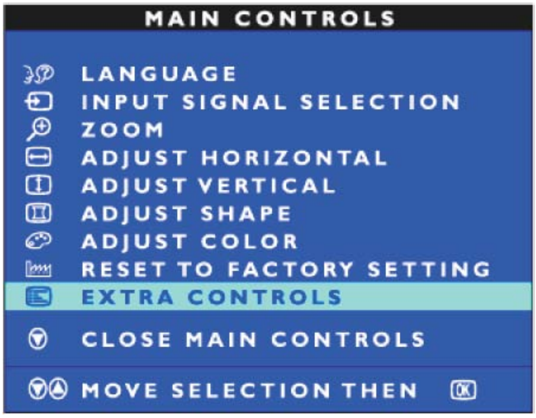
EXTRA CONTROLS is a set of three feature, including ADJUST MOIRE. Moire is a fringe patten arising from the interference between two superimposed line pattens. To adjust your moire, follow the steps below. Note: use only if necessary. By activating ADJUST MOIRE, sharpness can be affected.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the DOWN CURSOR button until EXTRA CONTROLS is highlighted.

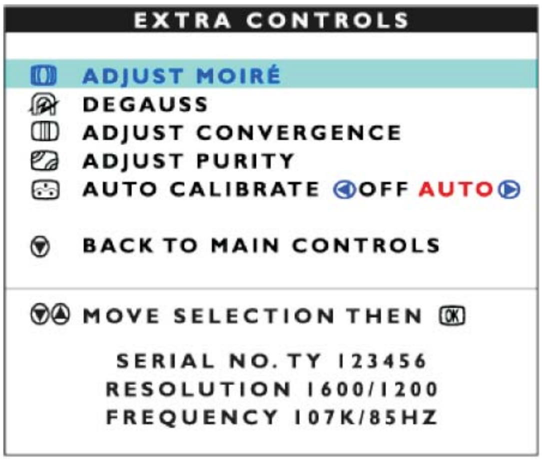
OSD Adjustments (Continued)

Go to cover page



3) Press the button. The EXTRA CONTROLS window appears. ADJUST MOIRE will be highlighted.

4) Press the button until ADJUST MOIRE is highlighted.

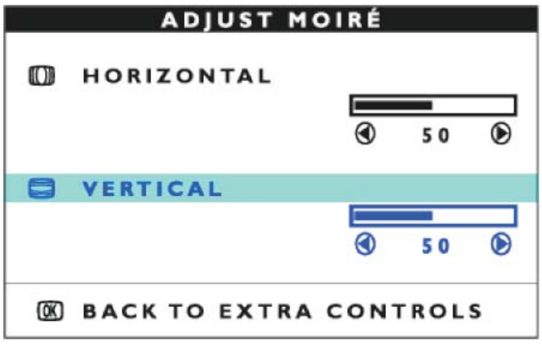


5) Press the button. The ADJUST MOIRE window appears.



6) Press the button until HORIZONTAL is highlighted. To adjust the horizontal moire, press the or button.

7) Press the button until VERTICAL is highlighted. To adjust the vertical moire, press the or button.



8) When the vertical moire is adjusted, press the button to return to the EXTRA CONTROLS window. BACK TO MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

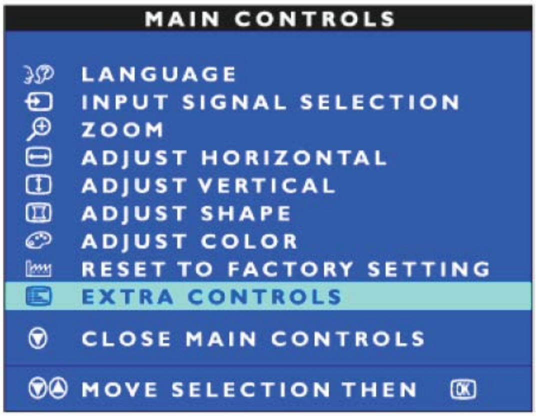
...To exit completely, press the button.

DEGAUSS

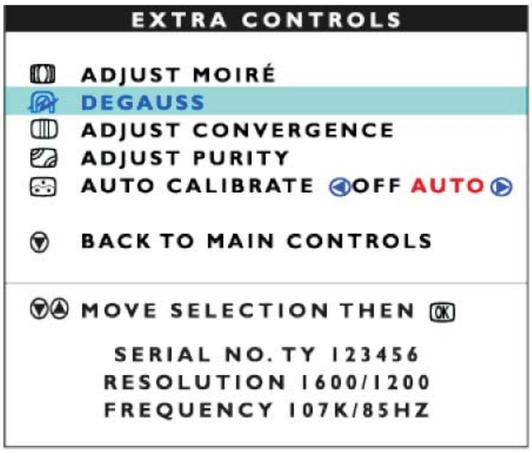
EXTRA CONTROLS is a set of three features, including DEGAUSS. Degaussing remove electromagnetic build up that may distort the color on your screen.

1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until EXTRA CONTROLS is highlighted.



3) Press the button. The EXTRA CONTROLS window appears. Press the button until DEGAUSS is highlighted.



4) To degauss your screen, press the button. Your screen will be degaussed, then the MAIN CONTROLS will reappear. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

. . . to continue to ADJUST MOIRE, press the button until EXTRA CONTROLS is highlighted. Next, start with step 3 under EXTRA CONTROLS, ADJUST MOIRE.

...To exit completely, press the button.

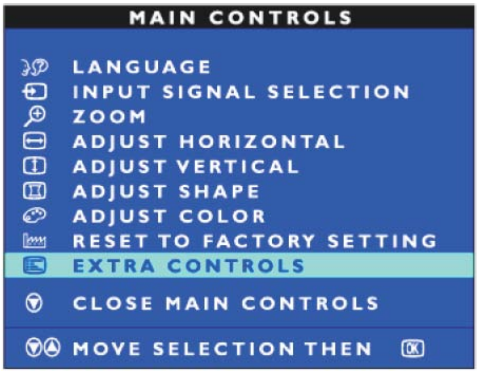
ADJUST CONVERGENCE (Not available in all models)

EXTRA CONTROLS is a set of features, including ADJUST CONVERGENCE. Convergence is a process by which a color is created by blending other colors. For example, white is created by blending red, blue, and green. If these colors do not completely blend

together (converge) then you may see unwanted red, green, or blue lines or dots. To adjust the convergence, follow the stepsbelow. Note: Use only if necessary. Remember: you must degauss the monitor BEFORE adjusting the convergence.

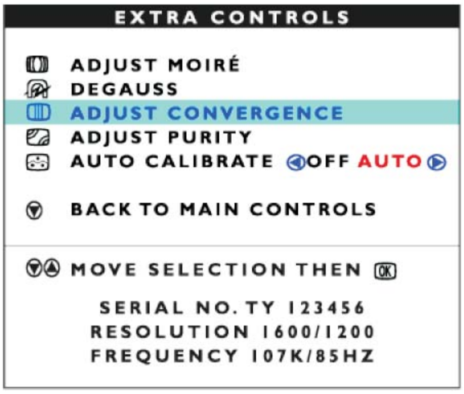
1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until EXTRA CONTROLS is highlighted.

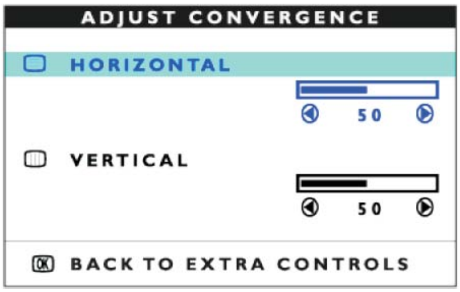


3) Press the button. The EXTRA CONTROLS window appears. Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the convergence.

4) Press the button until ADJUST CONVERGENCE is highlighted.

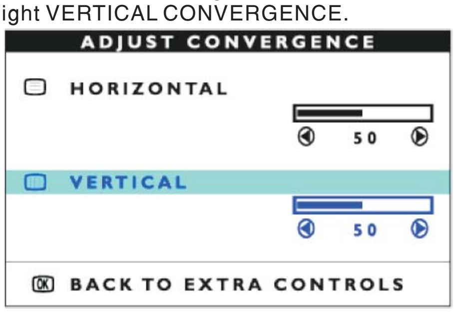


5) Press the button. The ADJUST CONVERGENCE window appears. ADJUST HORIZONTAL is highlighted.



6) To adjust the horizontal convergence, press the or button.

7) When the horizontal convergence is adjusted, press the button to highlight VERTICAL CONVERGENCE.



8) To adjust the vertical convergence, press the or button.

9) When the vertical convergence is adjusted, press the button to return to the EXTRA CONTROLS window. BACK TO MAIN CONTROLS is highlighted.

Smart Help

After returning to EXTRA CONTROLS . . .
. . . to continue to ADJUST PURITY, press the button until ADJUST PURITY is highlighted. Next, start with step 4 under EXTRA CONTROLS - ADJUST PURITY.

Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the purity.

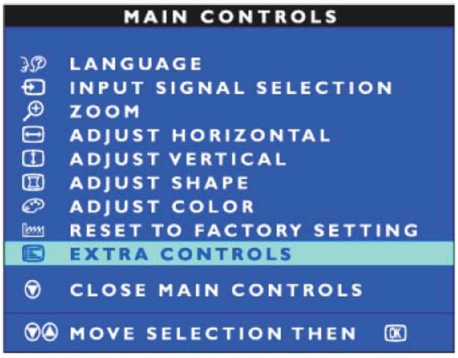
. . . to exit completely, press the button twice.

ADJUST PURITY (Not available in all models)

EXTRA CONTROLS is a set of features, including ADJUST PURITY. Purity is a process by which colors appear clear and untainted, especially in the four corners of the monitor. Purity can be affected by such things as the presence of a magnetic source near the monitor or even by the ambient room temperature. For example, you might see the color red in a corner of the monitor screen where you should see only a pure white. To adjust the purity, follow the steps below. Note:Use only if necessary. Remember: you must degauss the monitor BEFORE adjusting the purity.

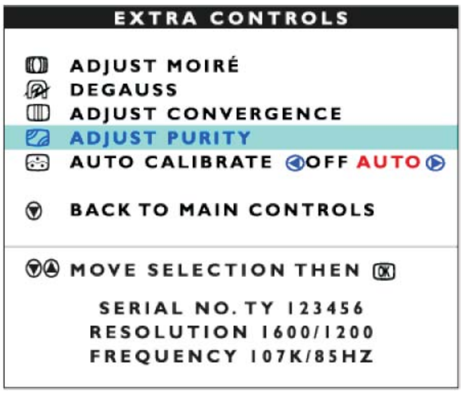
1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until EXTRA CONTROLS is highlighted.



3) Press the button. The EXTRA CONTROLS window appears. Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the purity.

4) Press the button until ADJUST PURITY is highlighted.



5) Press the . The ADJUST PURITY window appears. NS PUTRITY is highlighted.

OSD Adjustments (Continued)

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6) Press the or button, to adjust NS PURITY and optimalize the purity performance.

7) When adjustment finished, press the button to return to the EXTRA CONTROLS window.BACK TO MAIN CONTROLS is highlighted.

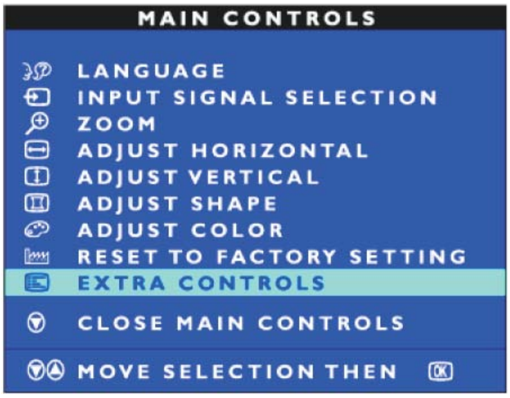
Smart Help After returning to EXTRA CONTROLS . . .
. . . to continue to ADJUST PURITY, press the button until AUTO CALIBRATE is highlighted. Next, start with step 4 under EXTRA CONTROLS -AUTO CALIBRATE.
. . . to exit completely, press the button twice.

AUTO CALIBRATE (Not available in all models)

EXTRA CONTROLS is a set of three features, including AUTO CALIBRATE. Auto Calibrate regularly readjusts the color to its original value for any of the ADJUST COLOR selections, including USER PRESET. AUTO CALIBRATE also adjusts the luminance and black level of the monitor, so that all three items remain at original settings. This helps extend the useful life of the monitor. The calibration process takes less than 6 seconds to complete.

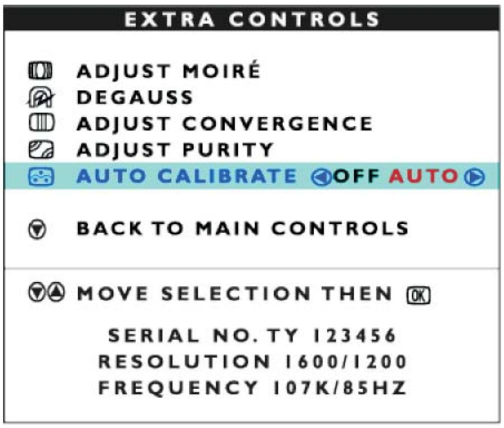
1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until EXTRA CONTROLS is highlighted.



3) Press the button. The EXTRA CONTROLS window appears.

4) Press the button until AUTO CALIBRATE is highlighted.



5) Press the or button to select OFF or AUTO.

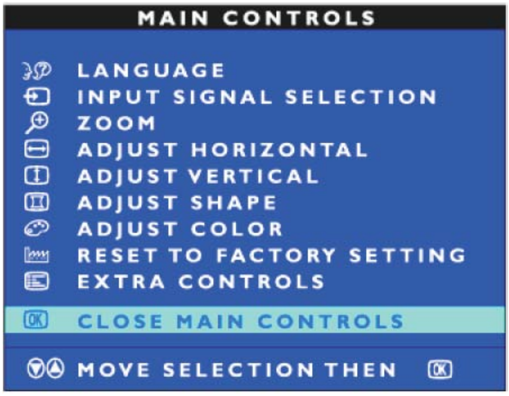
6) When the selection is made, press the button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN WINDOW will be highlighted.

7) Press the button to exit the MAIN CONTROLS window.

Smart Help After returning to MAIN CONTROLS . . .

. . . to exit completely, press the button.

CLOSE MAIN CONTROLS

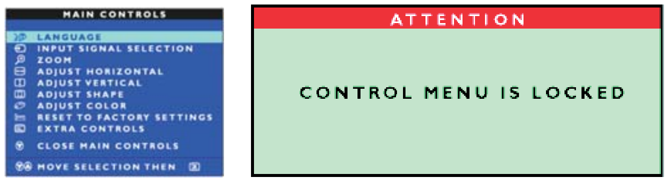


OSD LOCK

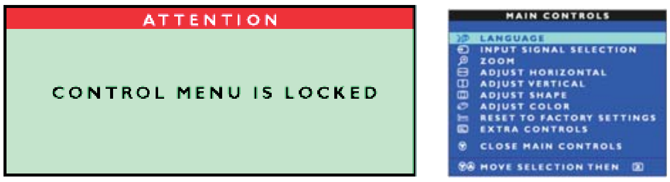
OSD LOCK is a feature which disables the OSD controls. It can be used when the monitor is set up for demonstration purposes or when adjustment of the OSD is not desirable.

Switch on OSD LOCK feature:

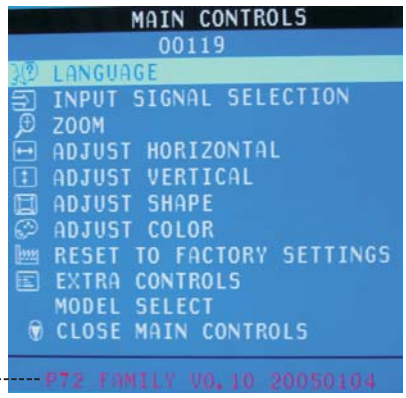
Press and hold the button continuously for 15 seconds.
Release the button when the message
" CONTROL MENU IS LOCKED" appears.



Switch off OSD lock feature:
Press and hold the button continuously for 15 seconds or until the message window "CONTROL MENU IS LOCKED"disappears. And "MAIN CONTROLS" appears.



To access factory mode
1. Turn off monitor(don't turn off PC)
2. Press and simultaneously on the front control pane, then press , wait until the OSD menu with characters P72 FAMILY V0.10 20050104 (below OSD menu) come on the screen of monitor.



Factory Mode---------- Indicator

3. If OSD menu disappears on the screen of monitor, press again(anytime), then the OSD menu comes on the screen again.

4. Using ▲ ▼ : to select OSD menu.
5. Using ◄ ► : to increase or decrease the setting.
6. Using OK : to access/confirm the selection.

To leave factory mode

7. After alignment of factory mode, turn off monitor(if you do not run off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode.)

To access BURN IN mode
First of all, monitor displays an image.
1. Disconnect the video cable(interface cable).
2. Turn off monitor
3. Press ◄ ► and ⏻ simultaneously on the front control panel, then the BURN IN mode comes on the screen of monitor as below.

50 seconds around



5 second around



repeat

4. Reconnect the video cable, then return the normal image.

SERVICE MODE (indication-factory mode)



00119: stand for
1. Using 10 hours already
2. Turn on/off 10 times.
3. Using several hours + turn on/off monitors.

Default setting of MODEL SELECT (Do not change it.)

MODEL SELECT

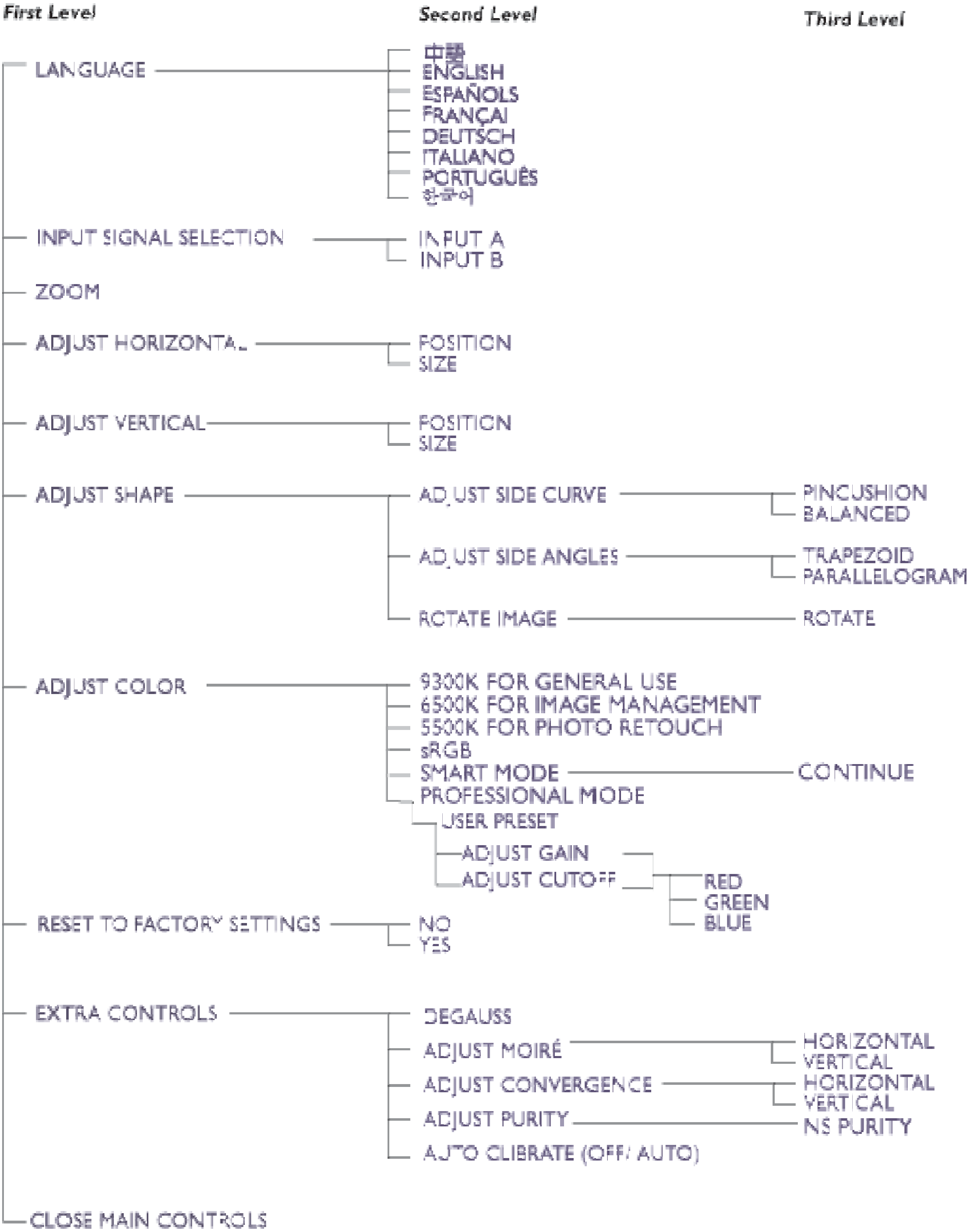
RESERVE
RESERVE
RESERVE
RESERVE
■ 130K 202P7 SDI
■ SWDDC

OSD Tree

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The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as reference when you want to later on work your way around the different adjustments.



DDC Instructions

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General

DDC Data Re-programming
In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed"Analog DDC IC, & EEPROM".
It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information
Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data(EDID) information may be also obtained from VESA.

System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98 .
   You have to Install the EDID_PORT_Tool under Win2000/XP . As Fig. 1 .

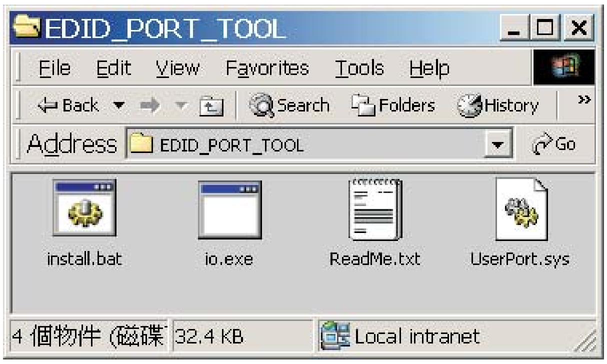


Fig. 1

A. Cody the "UserPort.sys" to C:\WINNT\system32\drivers(win2000)
C:\WINDOWS\system32\drivers(winXP)

B. Running " io.exe" everytime, Before you start to programming edid data .

3. EDID46.EXE program (12NC: 3138 106 10103) .

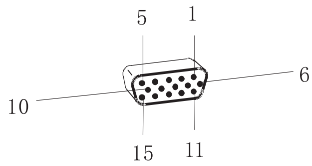
4. A/D Alignment kits (12NC: 3138 106 10396) shown as Fig. 2:
   inclusion : a. Alignment box x1



Fig. 2

b. Printer cable x1
c. (D-Sub) to (D-Sub) cable x1
d. (DVI-D) to (D-Sub) cable x1

Note: The EDID46.EXE is a windows-based program, which cannot be run in MS-DOS.



Pin assignment

15-pin D-Sub Connector

PIN No.	SIGNAL
1	Red video input
2	Green video input / sync on green
3	Blue video input
4	GND
5	GND -Cable detect
6	Red video GND
7	Green video GND
8	Blue video GND
9	DDC +3.3V or +5V
10	Logic GND
11	GND
12	Serial data line (SDA)
13	H-sync / H+V
14	V-sync
15	Data clock line (SCL)

Configuration and procedure

There is no Hardware DDC (DDC IC) anymore. Main EEPROM stores all factory settings and DDC data (EDID code) which is also called Software DDC. The following section describes the connection and procedure for Software DDC application. The main EEPROM can be re-programmed by enabling " factory memory data write" function on the DDC program (EDID46.EXE).

Initialize alignment box

In order to avoid that monitor entering power saving mode due to sync will cut off by alignment box, it is necessary to initialize alignment box before running programming software (EDID46.EXE). Following steps show you the procedures and connection.

Step 1: Supply 8-12V DC power source to the Alignment box by plugging a DC power cord .
Step 2: Connecting printer cable and D-Sub cable of monitor as Fig. 3

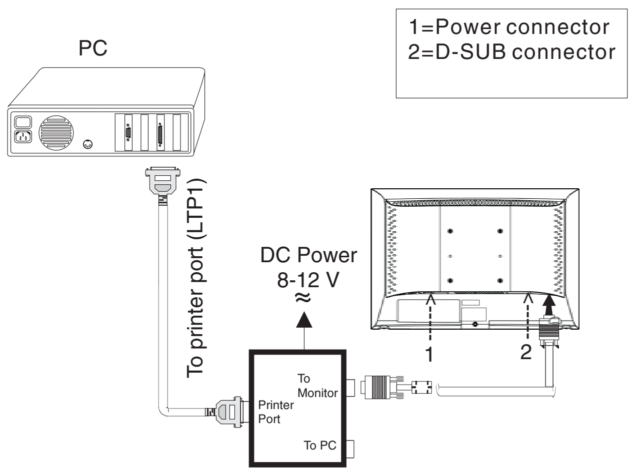


Fig. 3

DDC Instructions

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Step 3: Installation of EDID46.EXE

Method 1: Start on DDC program

Start Microsoft Windows.

1. The Program"EDID46.EXE" in service manual cd-rom be copyed to C:\ .
2. Click Start , choose Run at start menu of Windows as shown In Fig. 4.

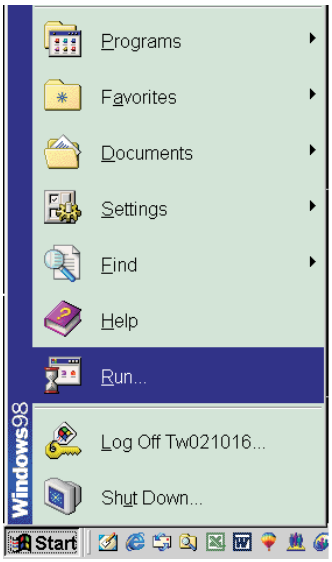


Fig. 4

3. At the submenu, type the letter of your computer's hard disk drive followed by :EDID46 (for example, C:\EDID46, as shown in Fig. 5).

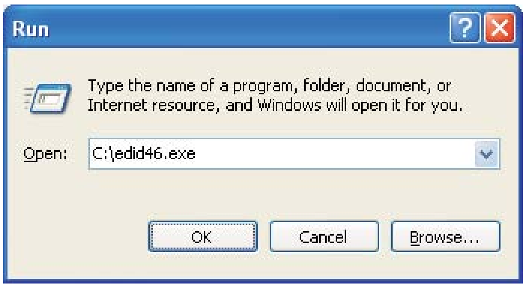


Fig. 5

4. Click OK button. The main menu appears (as shown in Fig. 6). This is for initialize alignment box.

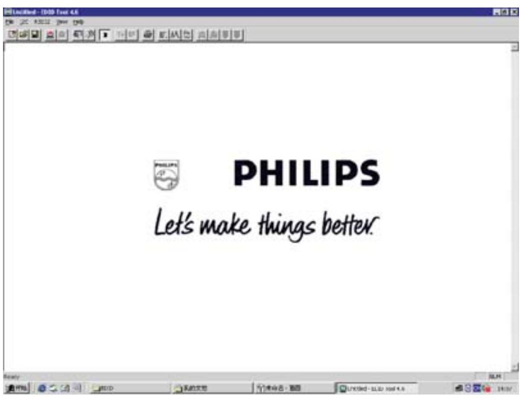


Fig. 6

Note 1: If the connection is improper, you will see the following error message (as shown in Fig. 7) before entering the main menu. Meanwhile, the (read EDID) function will be disable. At this time, please make sure all cables are connected correctly and fixedly, and the procedure has been performed properly.

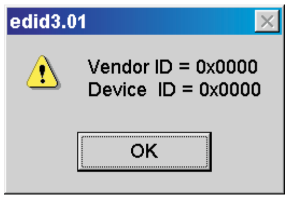


Fig. 7

Note 2: During the loading, EDID46 will verify the EDID data which just loaded from monitor before proceed any further function, once the data structure of EDID can not be recognized, the following error message will appear on the screen as below. Please confirm following steps to avoid this message.

1. The data structure of EDID was incorrect.
2. DDC IC that you are trying to load data is empty.
3. Wrong communication channel has set at configuration setup windows.
4. Cables loosed or poor contact of connection.

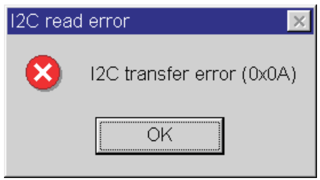


Fig. 8

Re-programming EEPROM(Software DDC IC)

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 9

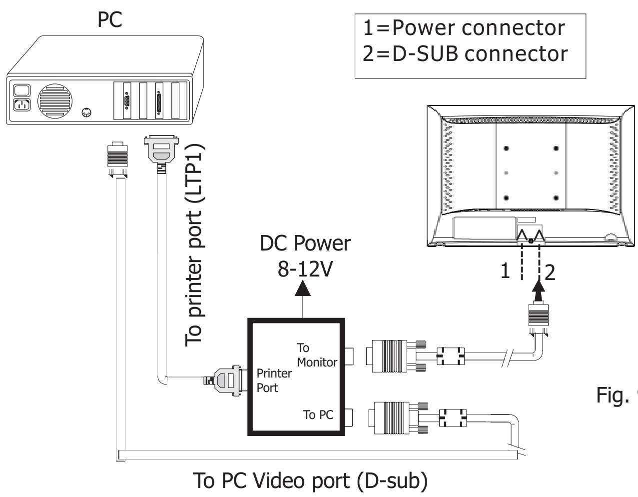


Fig. 9

Step 2: Read DDC data from monitor

1. Click  icon as shown in Fig. 10 from the tool bar to bring up the Channels "Configuration Setup" windows as shown in Fig. 11.

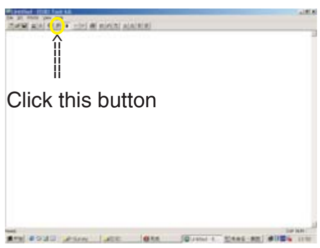


Fig. 10

2. Select the DDC2Bi as the communication channel.
   As shown in Fig. 11.

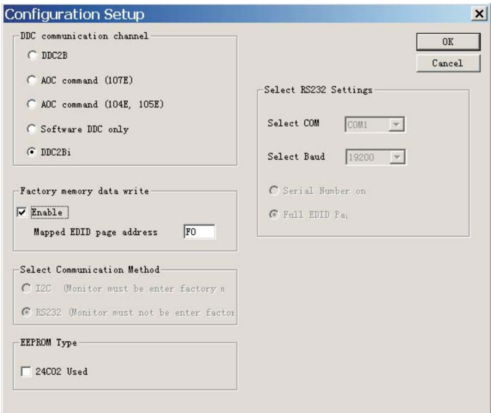


Fig. 11

3. Click OK button to confirm your selection.

4. Click  icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 12.

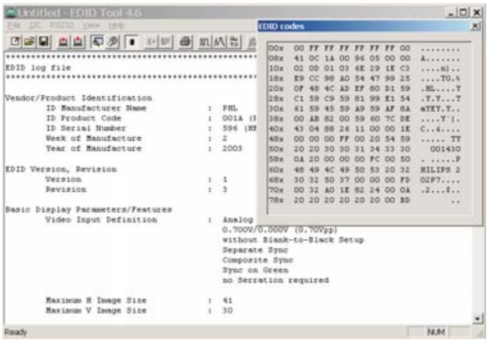


Fig. 12

Step 3: Modify DDC data (verify EDID version, week, year)

1. Click  (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 13 .
   EDID46 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

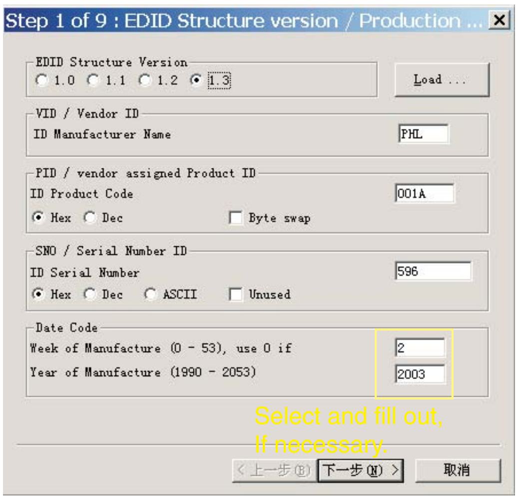


Fig. 13

Step 4: Modify DDC data (Monitor Serial No.)

1. Click Next , bring up Fig. 14.

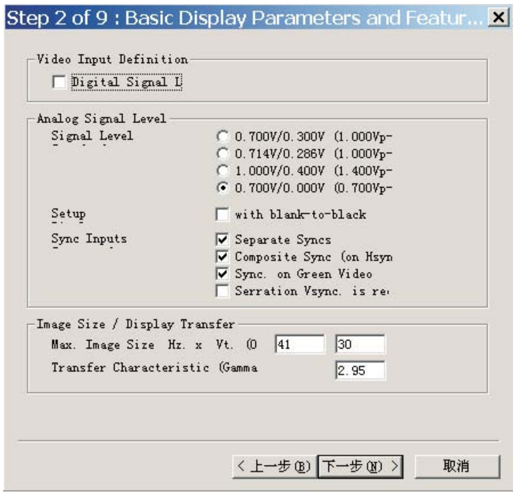


Fig. 14

2. Click Next , bring up Fig. 15.

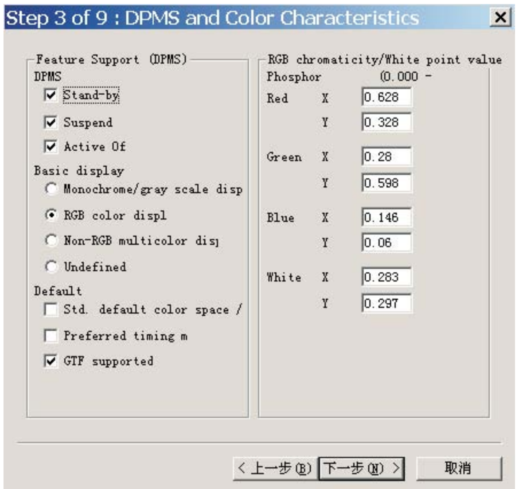


Fig. 15

3. Click Next , bring up Fig. 16.

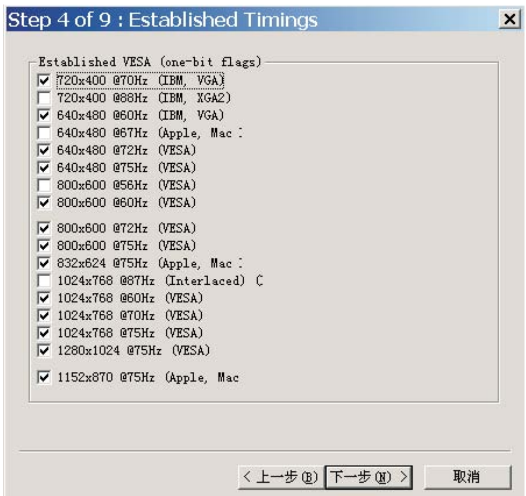


Fig. 16

4. Click Next , bring up Fig. 17.

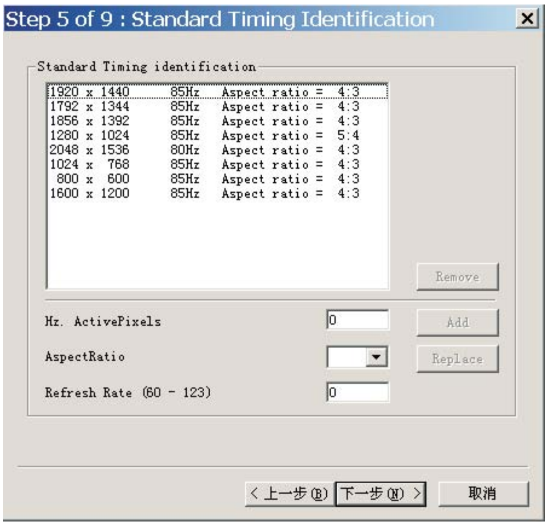


Fig. 17

5. Click Next , bring up Fig. 18.

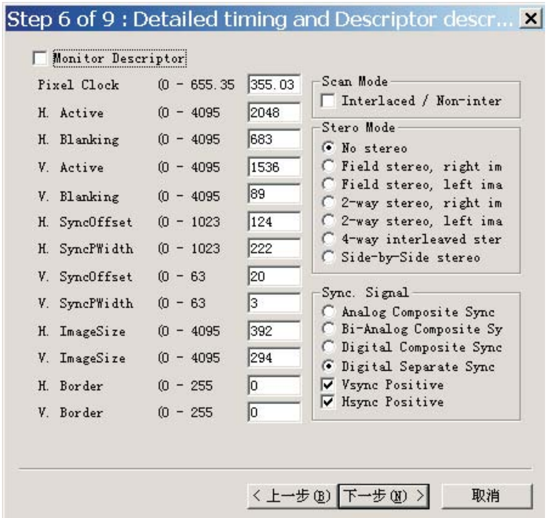


Fig. 18

6. Click Next , bring up Fig. 19.
In this step, please confirm the Descriptor Data Type is Monitor Range Limits, and all the items are same as below.



Fig. 19

7. Click Next , bring up Fig. 20.



Fig. 20

8. Click Next , bring up Fig. 21.
- Click Finish to exit the Step window.
- Serial number can be filled up at this moment (for example, TY 001440).

NOTE: You must modify the Serial NO. In step 9, otherwise the Serial NO. In OSD Couldn't be modified correctly.

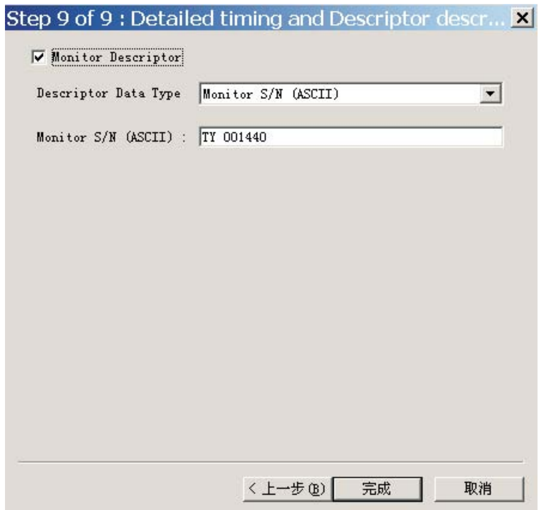


Fig. 21

Step 5: Write DDC data
1. Configuration should be as Fig. 22. And press OK.

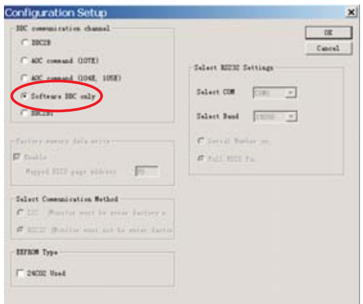


Fig. 22

NOTE: If you do not select "Software DDC only",when you execute " write EDID",it will bring up an error message as below.



2. Access Factory Mode
1). Turn off monitor(don't turn off PC)

2). Press ◀ ▶ and OK simultaneously on the front control pane, then press ⏻, wait until the OSD menu with characters P72 FAMILY V0.10 20050104 (below OSD menu) come on the screen of monitor (see Fig. 23).



Factory Mode------------ Indicator

Fig. 23

3). Push "Menu" to exit OSD menu.
4). Click (Write EDID) icon from the tool bar to write DDC data,wait for 10-15 seconds ,DDC data will be finished Writing.

3. Confirm Serial Number in User Mode
1) Press the ⏻ button to turn off the monitor. Press the ⏻ button again to turn on the monitor.
2) Press the OK button to bring up the OSD main menu.
3) Press the ▼ button to select Extra Controls, press the OK button to confirm your selection.
4) Confirm the Serial Number "TY 001440" is updated as shown in Fig. 24.



Fig.24

Step 6: Save DDC data
Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

1. Click (Save) icon (or click "file"-> "save as") from the tool bar And give a file name as shown in Fig. 25.
The file type is EDID46 file (*.ddc) which can be open in WordPad.
By using WordPad, the texts of DDC data & table (128 bytes, hex code) can be modified. If DDC TEXTS & HEX Table are completely correct, it can be saved as .ddc flie to re-load it into DDC IC for DDC Data application.

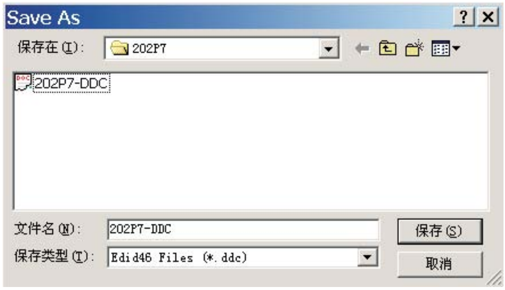


Fig. 25

2. Click Save.

Step 7: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. 26.

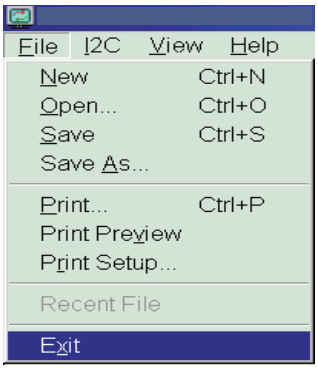


Fig. 26

Step 8: Turn off the monitor, exit the factory mode.

DDC DATA

Go to cover page

****

EDID log file

****

Vendor/Product Identification
ID Manufacturer Name : PHL
ID Product Code : 001A (HEX.)
ID Serial Number : 123456 (DEC.)
Week of Manufacture : 20
Year of Manufacture : 2005

EDID Version, Revision
Version : 1
Revision : 3

Basic Display Parameters/Features
Video Input Definition : Analog Video Input
0.700V/0.000V (0.70Vpp)
without Blank-to-Black Setup
Separate Sync
Composite Sync
Sync on Green
no Serration required

Maximum H Image Size : 41
Maximum V Image Size : 30

Display Transfer Characteristic : 2.95
(gamma)

Feature Support (DPMS) : Standby
Suspend
Active Off

Display Type : RGB color display
GTF supported : Based on GTF standard

Color Characteristics
Red X coordinate : 0.628
Red Y coordinate : 0.328
Green X coordinate : 0.28
Green Y coordinate : 0.598
Blue X coordinate : 0.146
Blue Y coordinate : 0.06
White X coordinate : 0.283
White Y coordinate : 0.297

Established Timings
Established Timings I : 720 x 400 @70Hz (IBM,VGA)
640 x 480 @60Hz (IBM,VGA)
640 x 480 @72Hz (VESA)
640 x 480 @75Hz (VESA)
800 x 600 @60Hz (VESA)

Established Timings II : 800 x 600 @72Hz (VESA)
800 x 600 @75Hz (VESA)
832 x 624 @75Hz (Apple,Mac II)
1024 x 768 @60Hz (VESA)
1024 x 768 @70Hz (VESA)
1024 x 768 @75Hz (VESA)
1280 x 1024 @75Hz (VESA)

Manufacturer's timings : 1152 x 870 @75Hz (Apple,Mac II)

Standard Timing Identification #1
Horizontal active pixels : 1920
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #2
Horizontal active pixels : 1792
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #3
Horizontal active pixels : 1856
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #4
Horizontal active pixels : 1280
Aspect Ratio : 5:4
Refresh Rate : 85

Standard Timing Identification #5
Horizontal active pixels : 2048
Aspect Ratio : 4:3
Refresh Rate : 80

Standard Timing Identification #6
Horizontal active pixels : 1024
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #7
Horizontal active pixels : 800
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #8
Horizontal active pixels : 1600
Aspect Ratio : 4:3
Refresh Rate : 85

Detailed Timing #1
Pixel Clock (MHz) : 355.03
H Active (pixels) : 2048
H Blanking (pixels) : 683
V Active (lines) : 1536
V Blanking (lines) : 89
H Sync Offset (F Porch) (pixels): 124
H Sync Pulse Width (pixels) : 222
V Sync Offset (F Porch) (lines) : 20
V Sync Pulse Width (lines) : 3
H Image Size (mm) : 392
V Image Size (mm) : 294
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
: Normal Display, No stereo
: Digital Separate sync.
: Positive Vertical Sync.
: Positive Horizontal Sync.

Monitor Descriptor #2
Serial Number : TY 123456

Monitor Descriptor #3
Monitor Name : PHILIPS 202P7

Monitor Descriptor #4
Monitor Range Limits
Min. Vt rate Hz : 50
Max. Vt rate Hz : 160
Min. Horiz. rate kHz : 30
Max. Horiz. rate kHz : 130
Max. Supported Pixel : 360

No secondary GTF timing formula supported.

Extension Flag : 0

Check sum : 14 (HEX.)

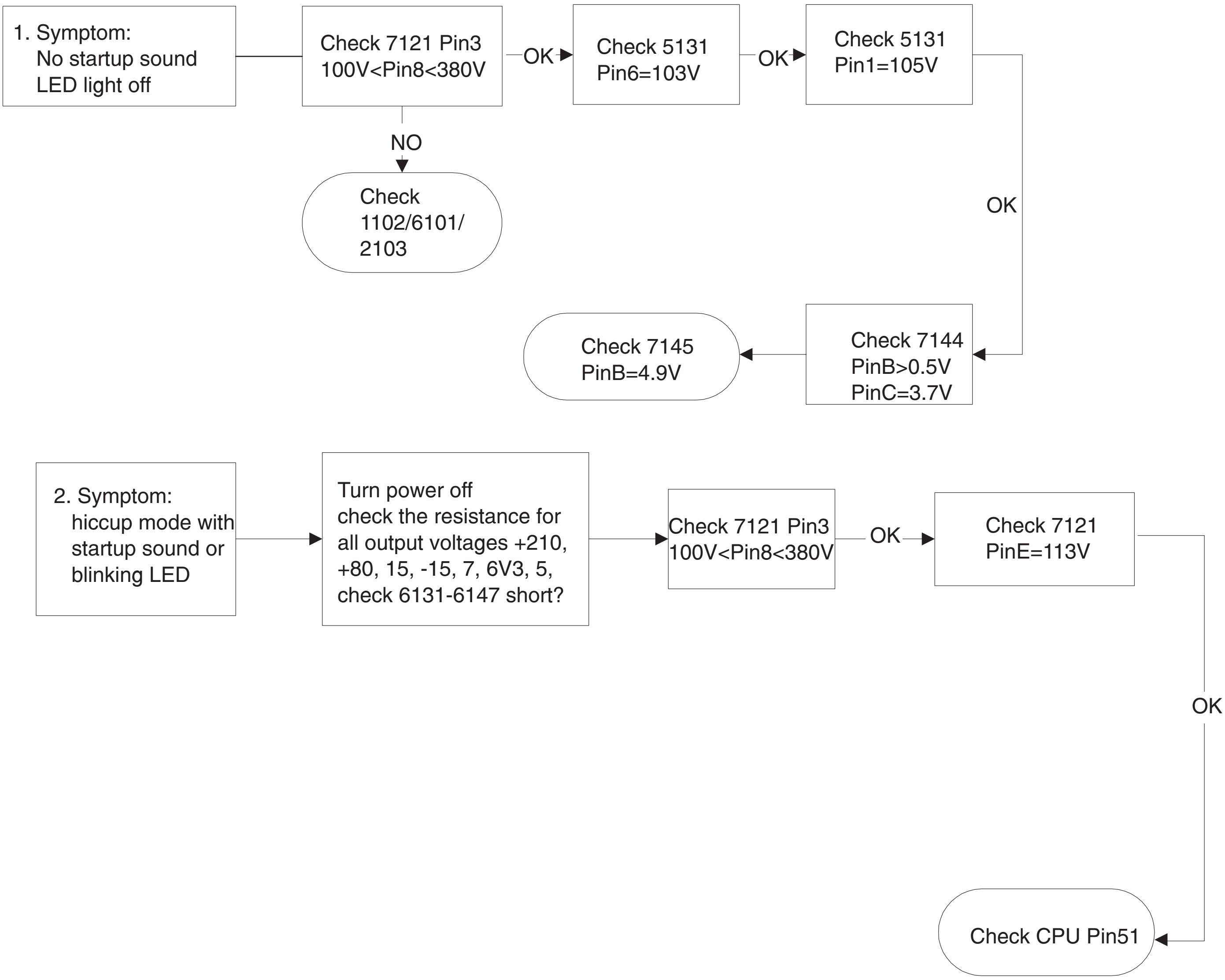
****
EDID data (128 bytes)
****

```
  0: 00   1: ff   2: ff   3: ff   4: ff   5: ff   6: ff   7: 00
  8: 41   9: 0c  10: 1a  11: 00  12: 40  13: e2  14: 01  15: 00
 16: 14  17: 0f  18: 01  19: 03  20: 6e  21: 29  22: 1e  23: c3
 24: e9  25: cc  26: 98  27: a0  28: 54  29: 47  30: 99  31: 25
 32: 0f  33: 48  34: 4c  35: ad  36: ef  37: 80  38: d1  39: 59
 40: c1  41: 59  42: c9  43: 59  44: 81  45: 99  46: e1  47: 54
 48: 61  49: 59  50: 45  51: 59  52: a9  53: 59  54: af  55: 8a
 56: 00  57: ab  58: 82  59: 00  60: 59  61: 60  62: 7c  63: de
 64: 43  65: 04  66: 88  67: 26  68: 11  69: 00  70: 00  71: 1e
 72: 00  73: 00  74: 00  75: ff  76: 00  77: 20  78: 54  79: 59
 80: 20  81: 20  82: 31  83: 32  84: 33  85: 34  86: 35  87: 36
 88: 0a  89: 20  90: 00  91: 00  92: 00  93: fc  94: 00  95: 50
 96: 48  97: 49  98: 4c  99: 49 100: 50 101: 53 102: 20 103: 32
104: 30 105: 32 106: 50 107: 37 108: 00 109: 00 110: 00 111: fd
112: 00 113: 32 114: a0 115: 1e 116: 82 117: 24 118: 00 119: 0a
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: 14
```

Go to cover page

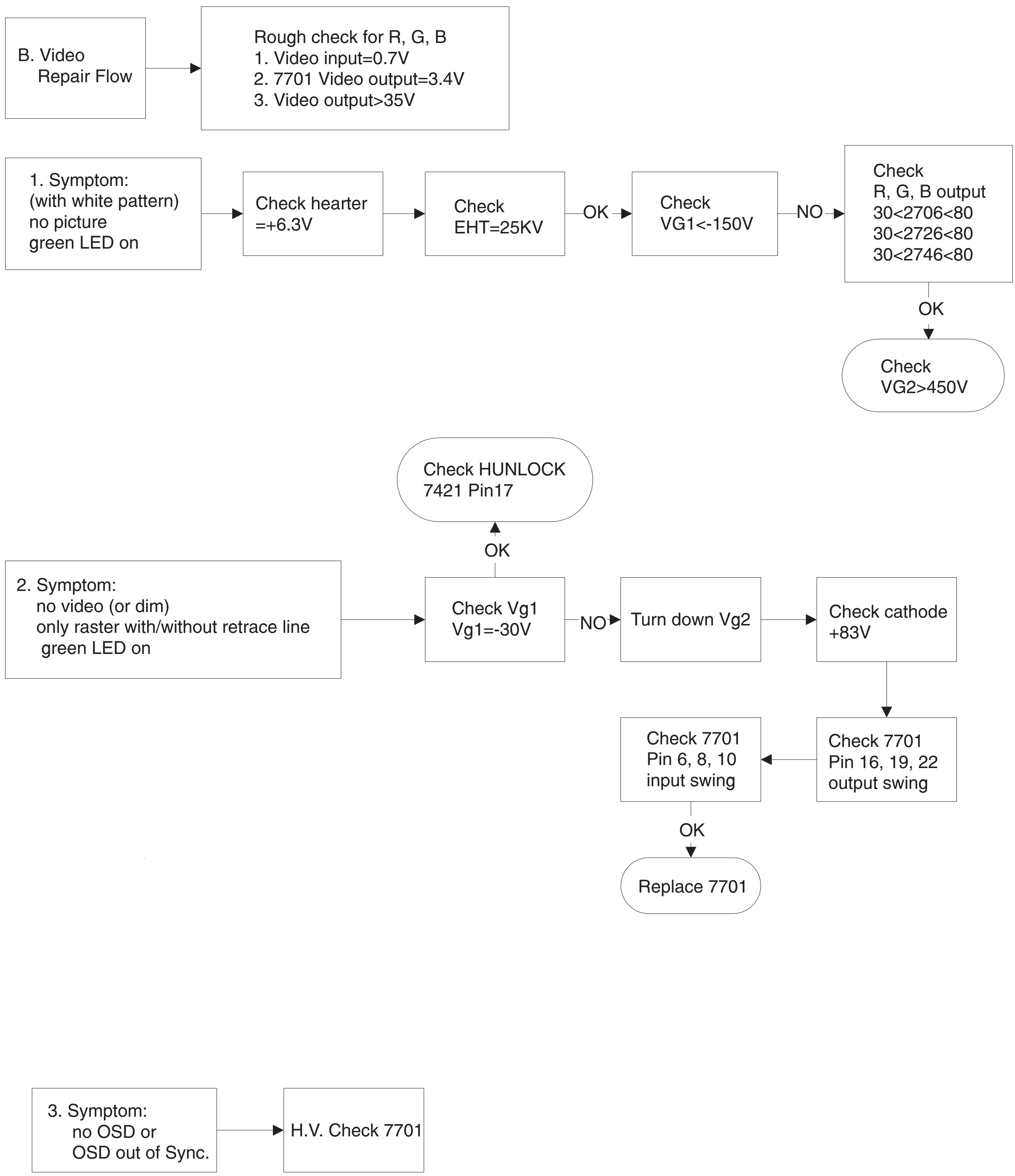
Repair Flow Chart

A. Power Supply Failure



Go to cover page

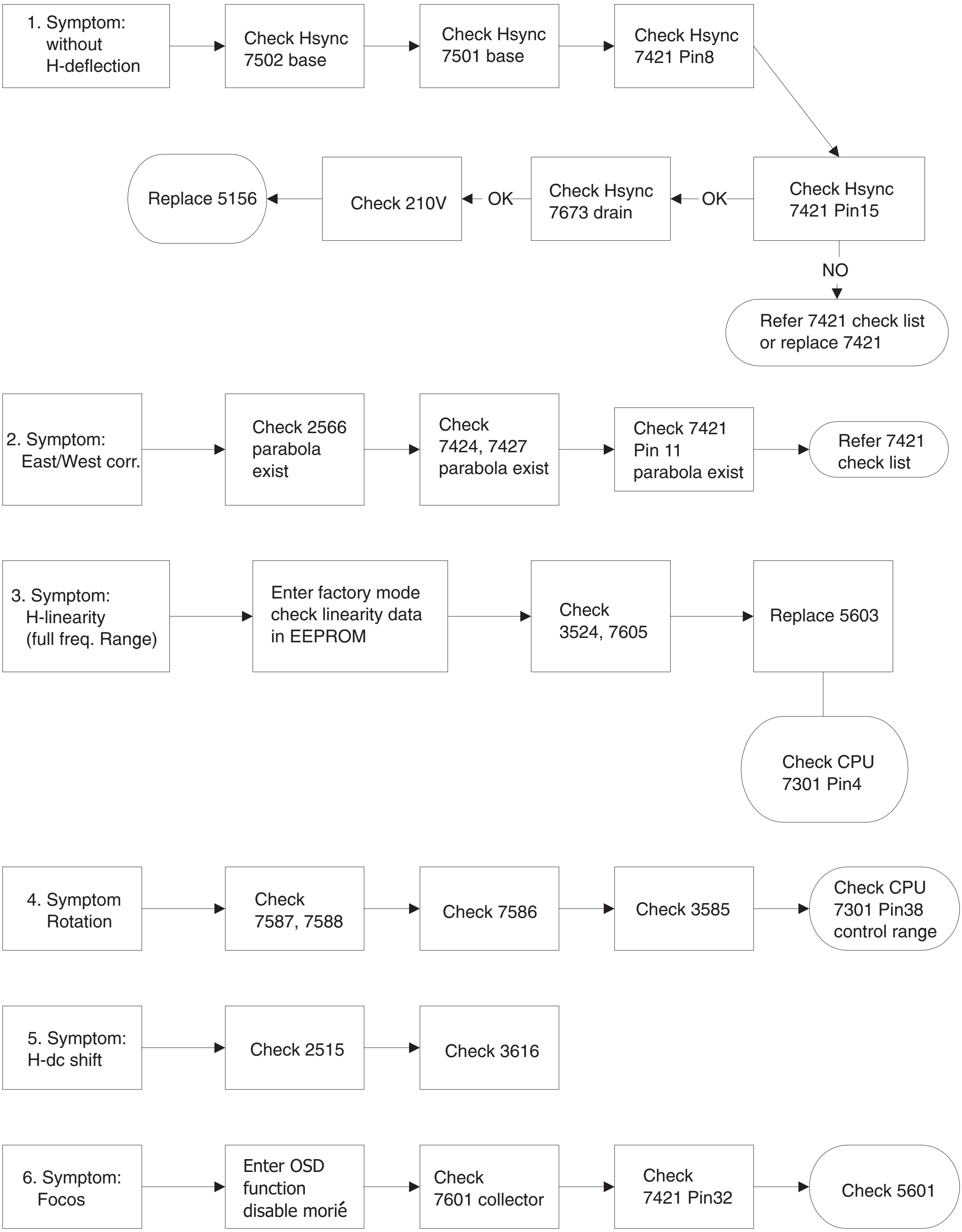
Repair Flow Chart (Continued)



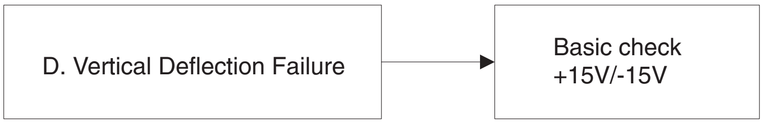
Go to cover page

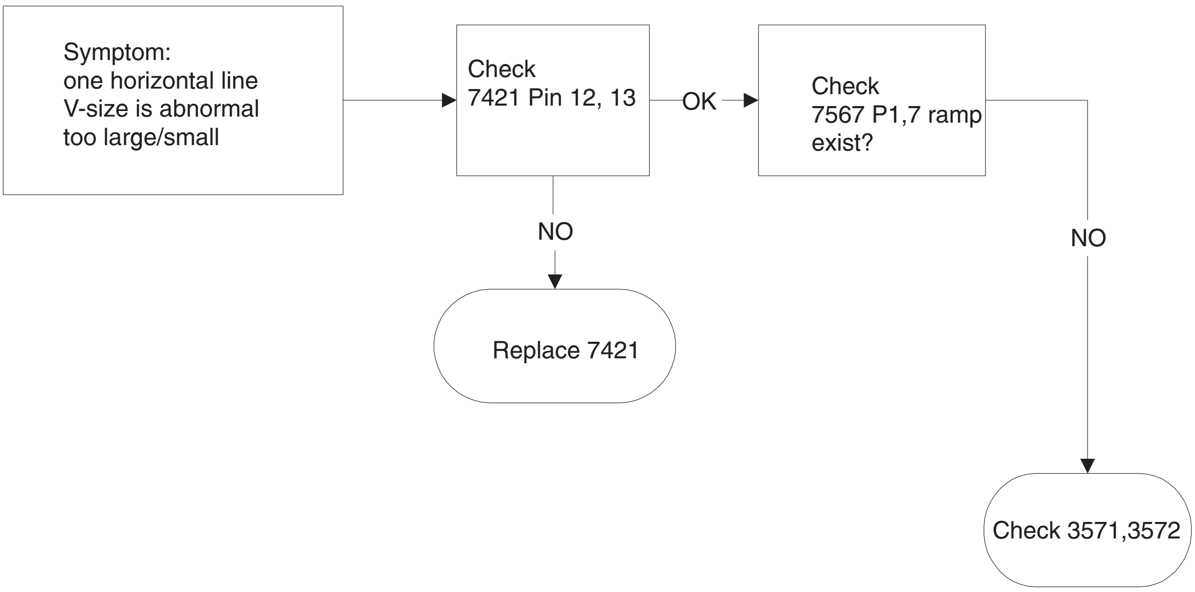
Repair Flow Chart (Continued)

C. Horizontal deflection output repair flow:



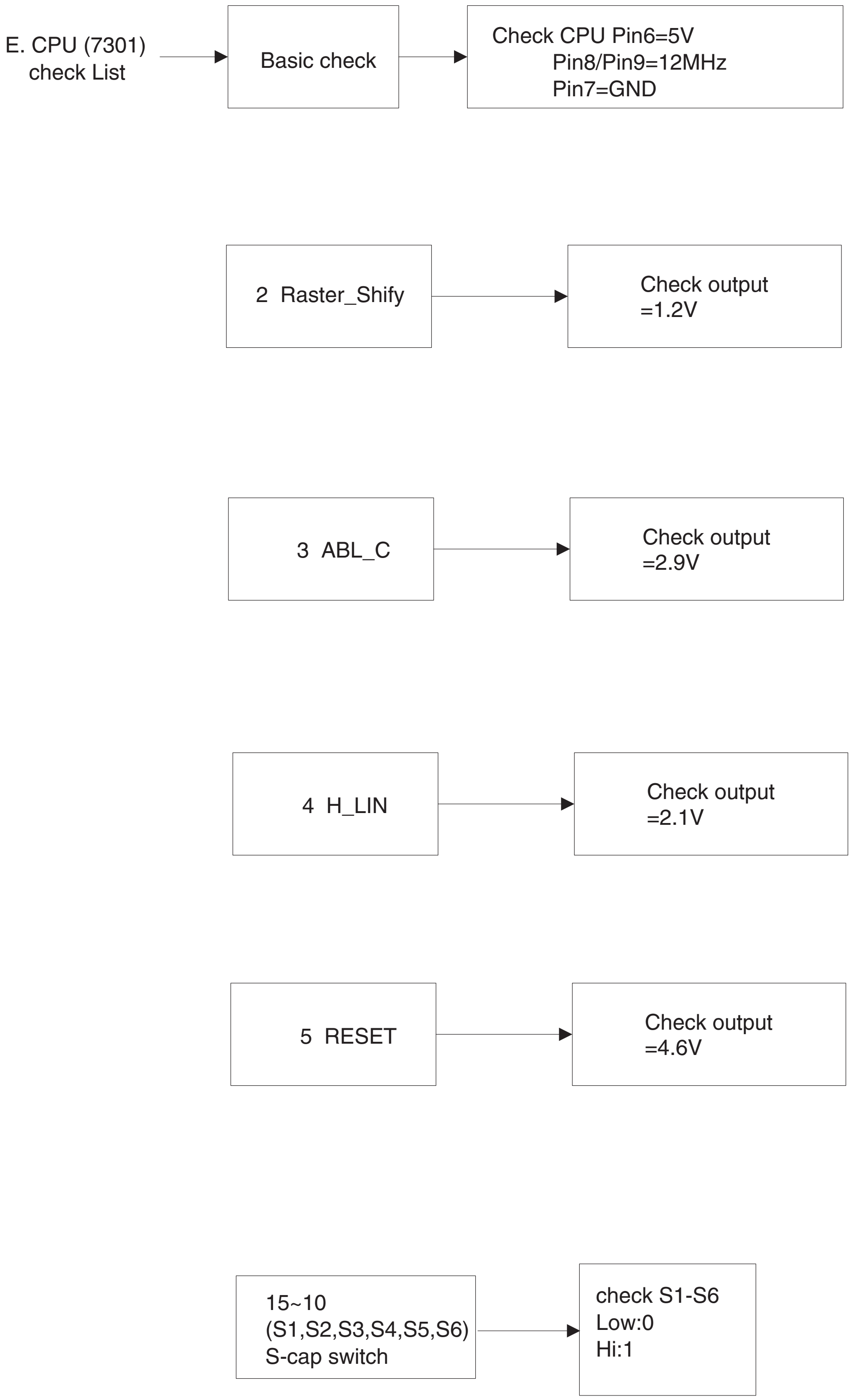
Repair Flow Chart (Continued)





Go to cover page

Repair Flow Chart (Continued)



Repair Flow Chart (Continued)

Go to cover page

18 H_UNLOCK → To H-deflection 7462 base

19 MUTE → To H-deflection 7466 base

20 OFF → To Control Board

22 Degauss → Check
active=hi
no active=low

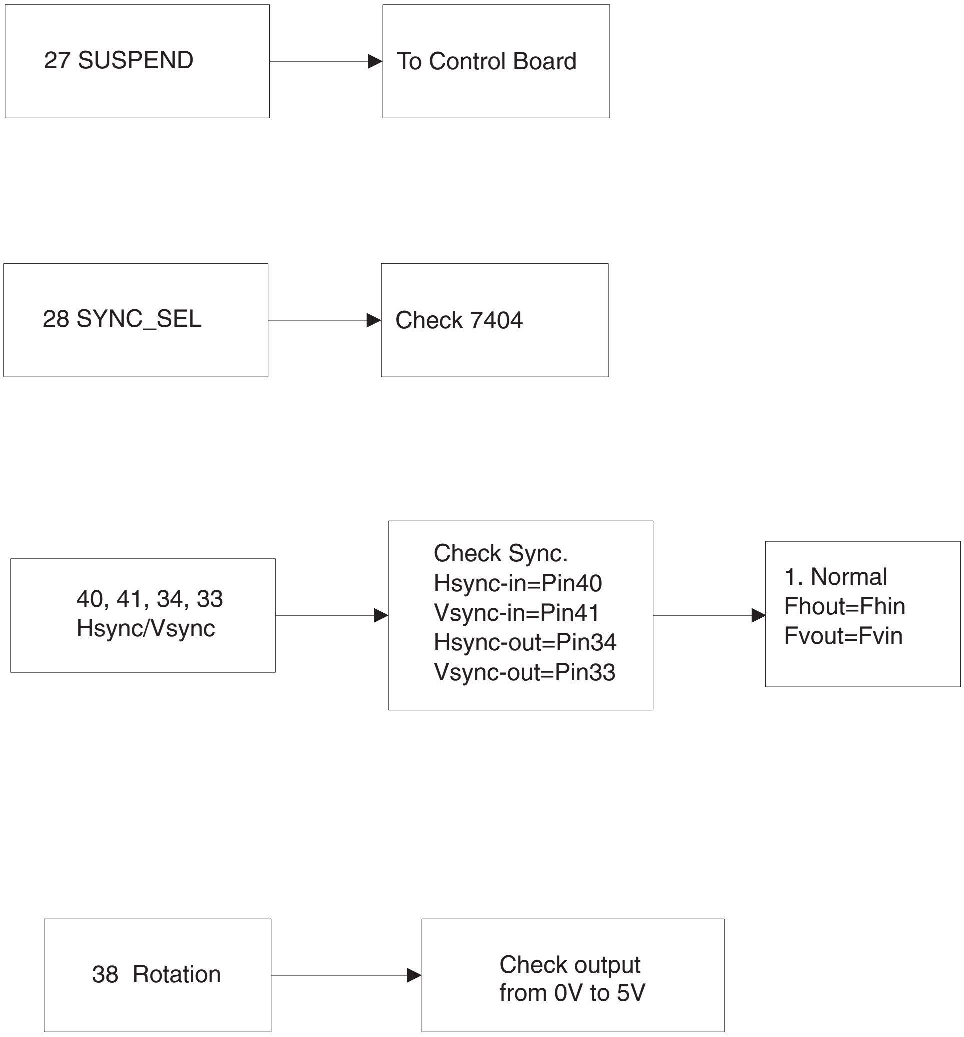
23 KEY_ADC → Check key Power, OK, LF, Brightness and Contrast keys

24 Selftest → Check Pin56

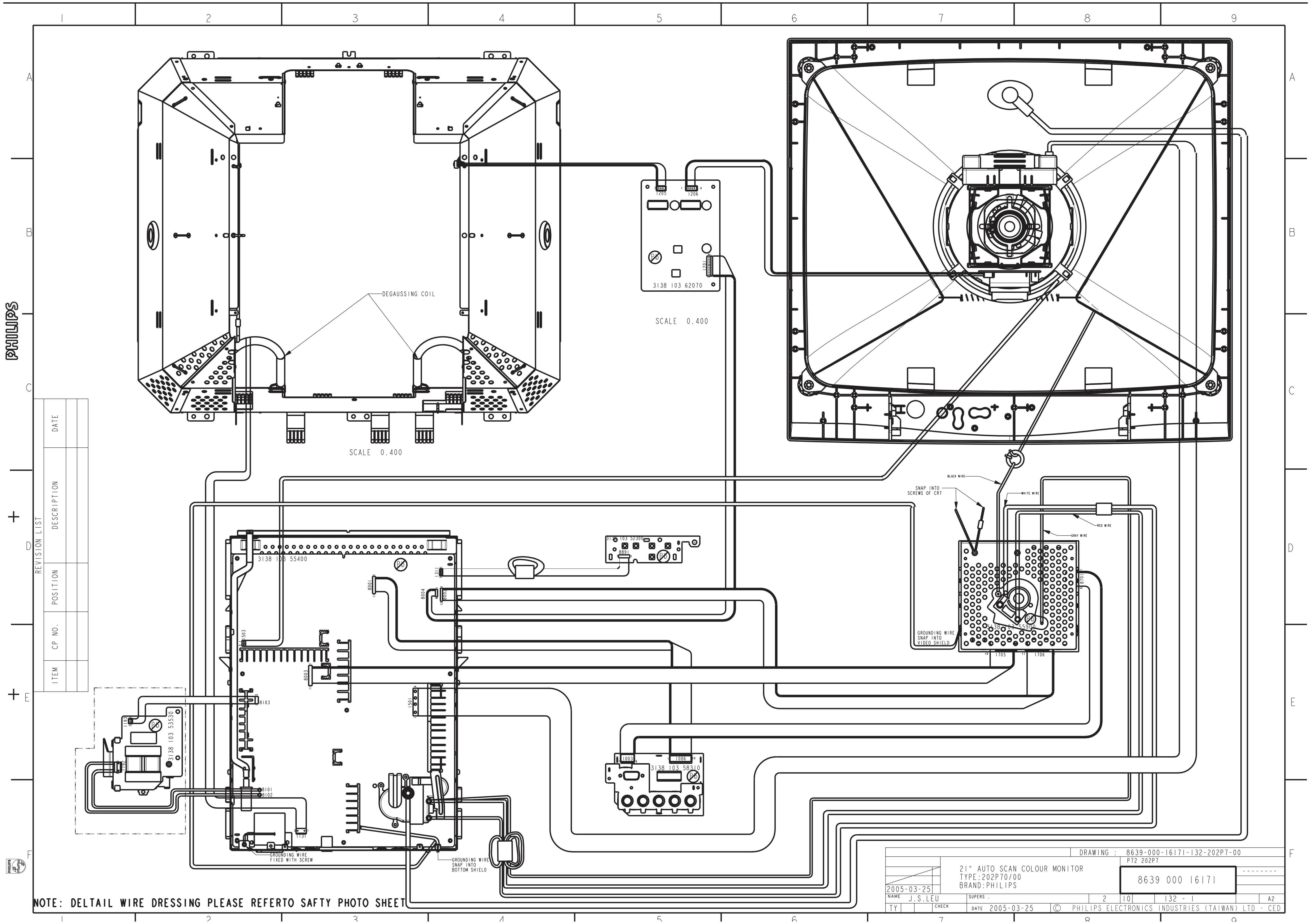
1. No H/V Sync&IF cable Pin5 floating	-show msg.
2. H/V Sync exist & IF cable Pin5 to ground	-normal
3. H/V Sync non-exist & IF cable Pin5 to gnd	-power saving
4. After 1891&1894&1895 pressed on, then power on(1102) with IF cable Pin5=L	-factory mode
5. After 1892&1893 pressed on, then power on (1102) without IF cable Pin5=H	-burn in mode

25, 26 DDC bus → Check idle status
SDA=Pin25=hi
SCI=Pin26=hi

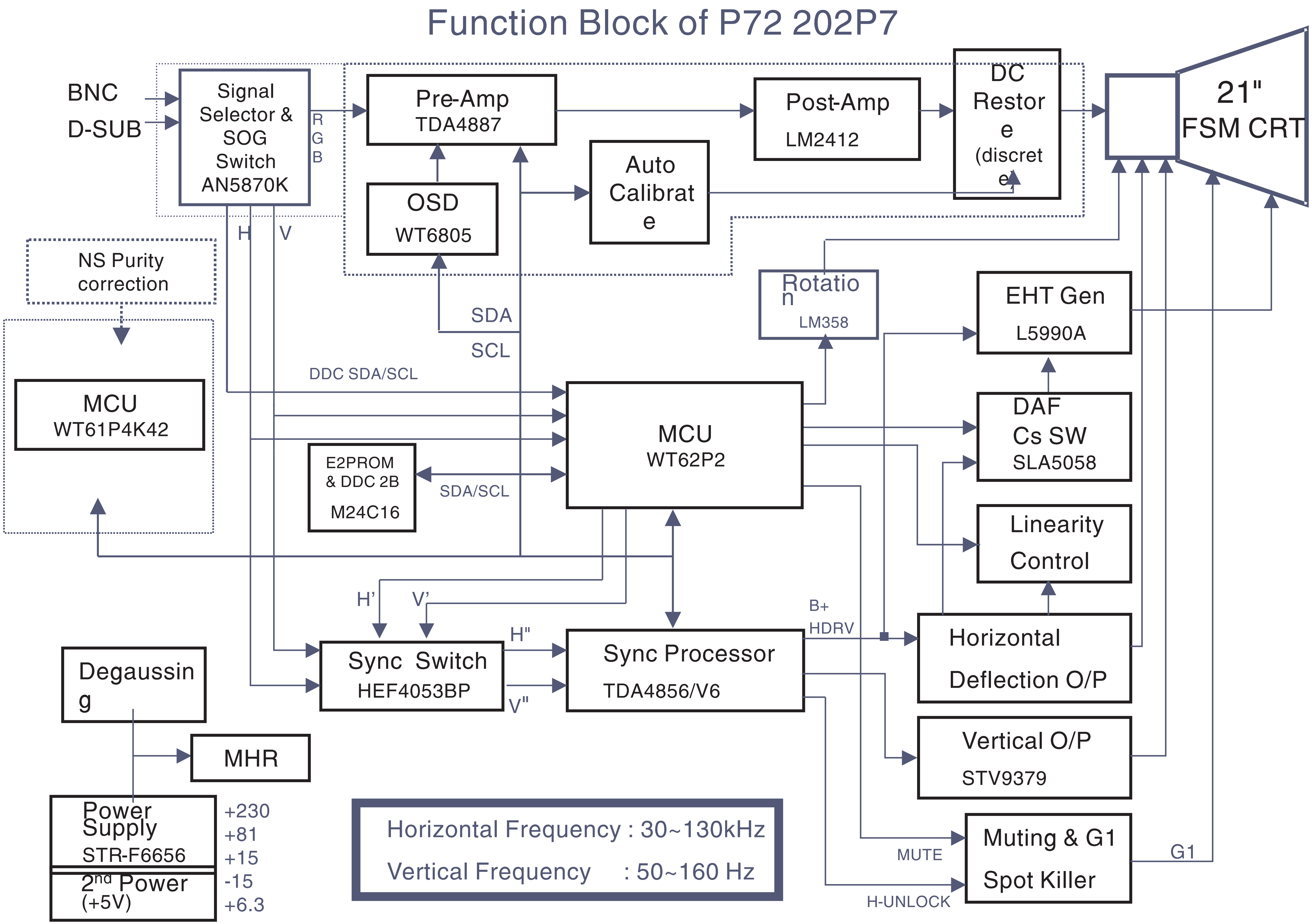
Repair Flow Chart (Continued)



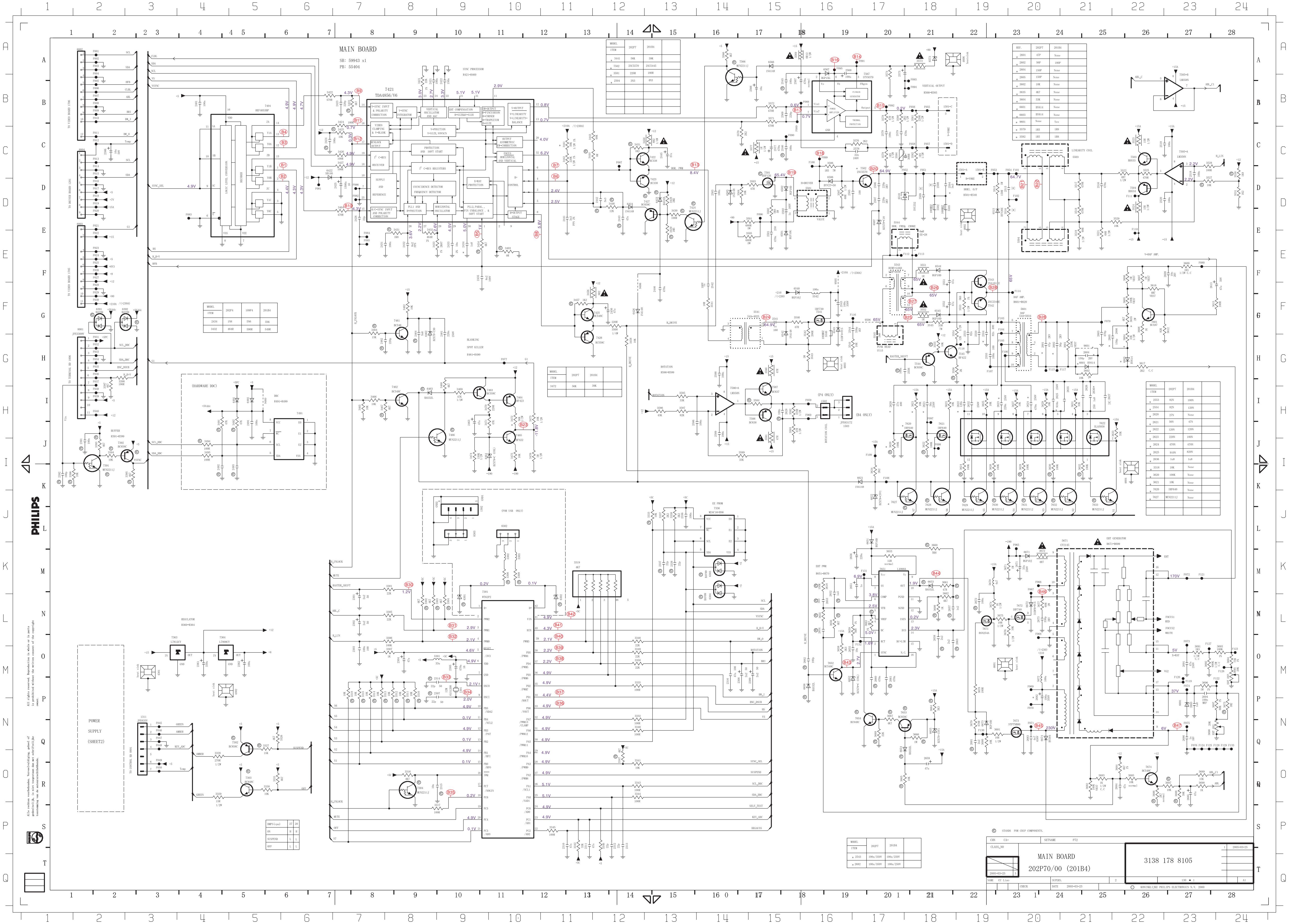
Wiring Diagram



Block Diagram

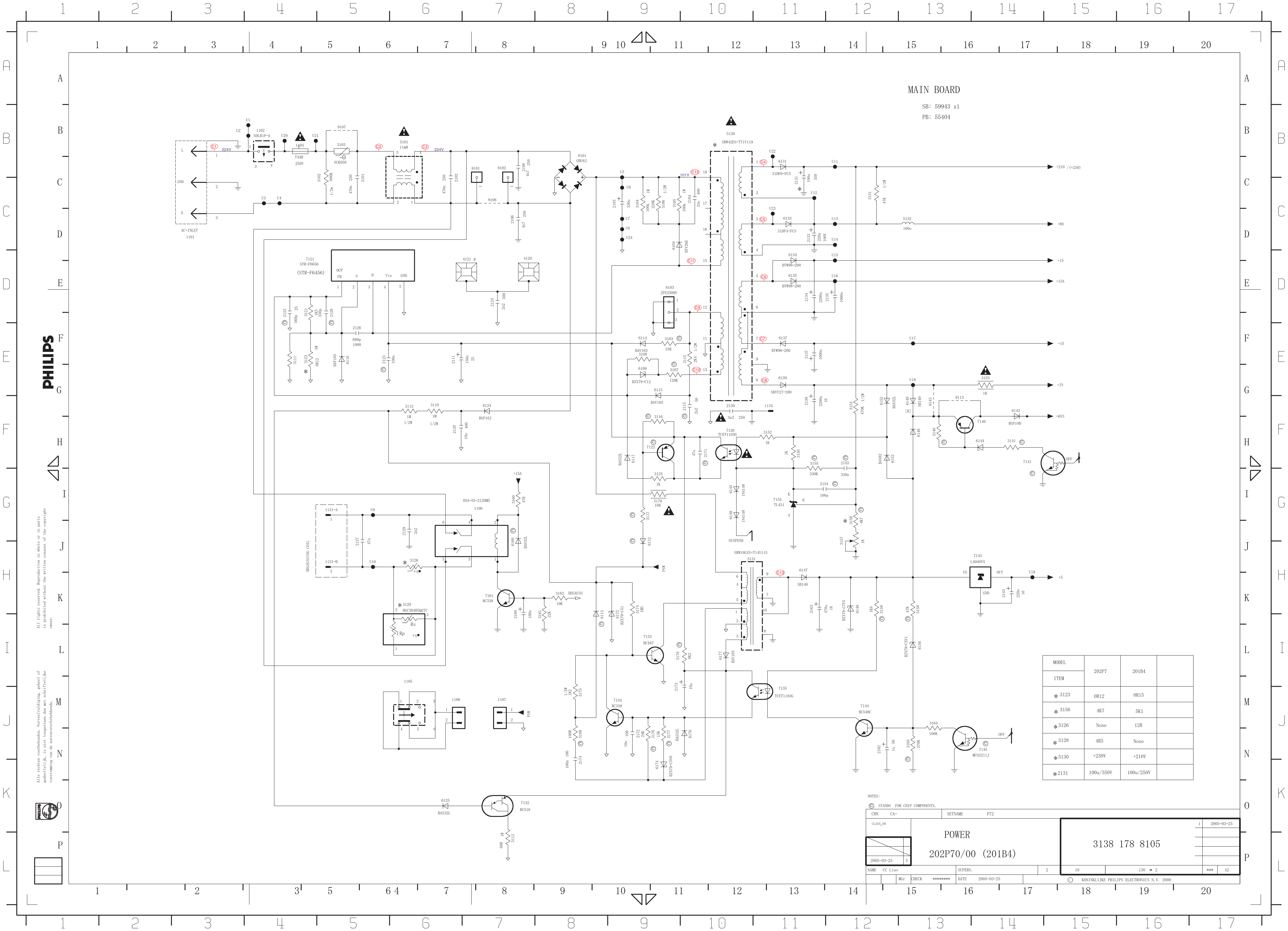


Main Schematic Diagram



Main Schematic Diagram

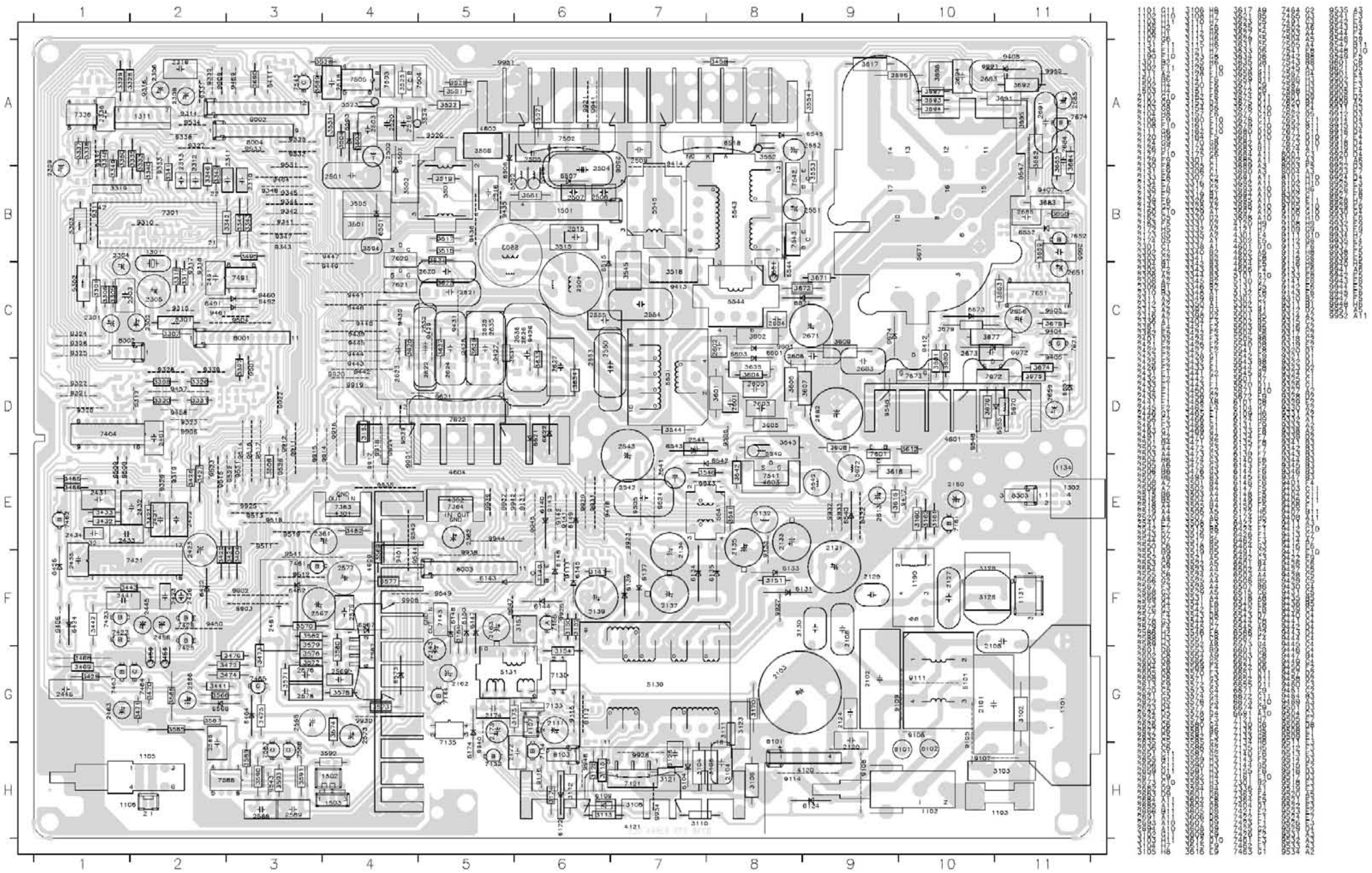
Go to cover page



MODEL / ITEM	202P7	201B4	
* 3123	0R12	0R15	
* 3156	4K7	5K1	
* 3126	None	12R	
* 3128	4R5	None	
* 5130	+230V	+210V	
* 2131	100u/350V	100u/250V	

Main Board C.B.A.-1

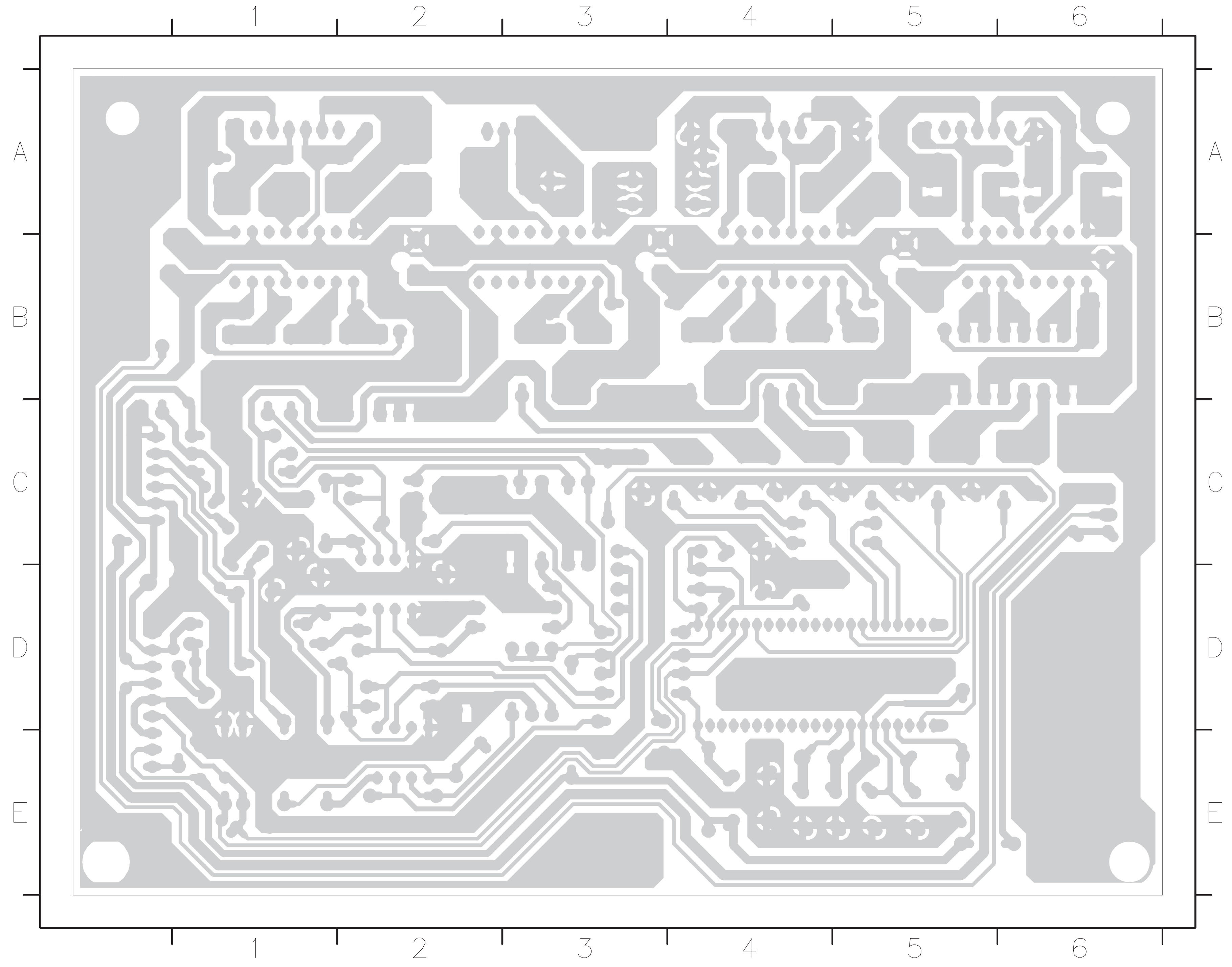
PHILIPS



CN: ECO-002335	CRT 202		
CLASS NO 3XX000	Pwr+Defl Board CRT 202 P4/P7	3138 103 5994	3 2004-12-02 / 2 2003-12-23 / 1 2002-04-11
2003-11-26			
NAME CC Liao/Hsiao	SUPERS 2	10 132 - 1	A3
CHECK	DATE 2003-11-26 ©	Philips Electronics N.V.	

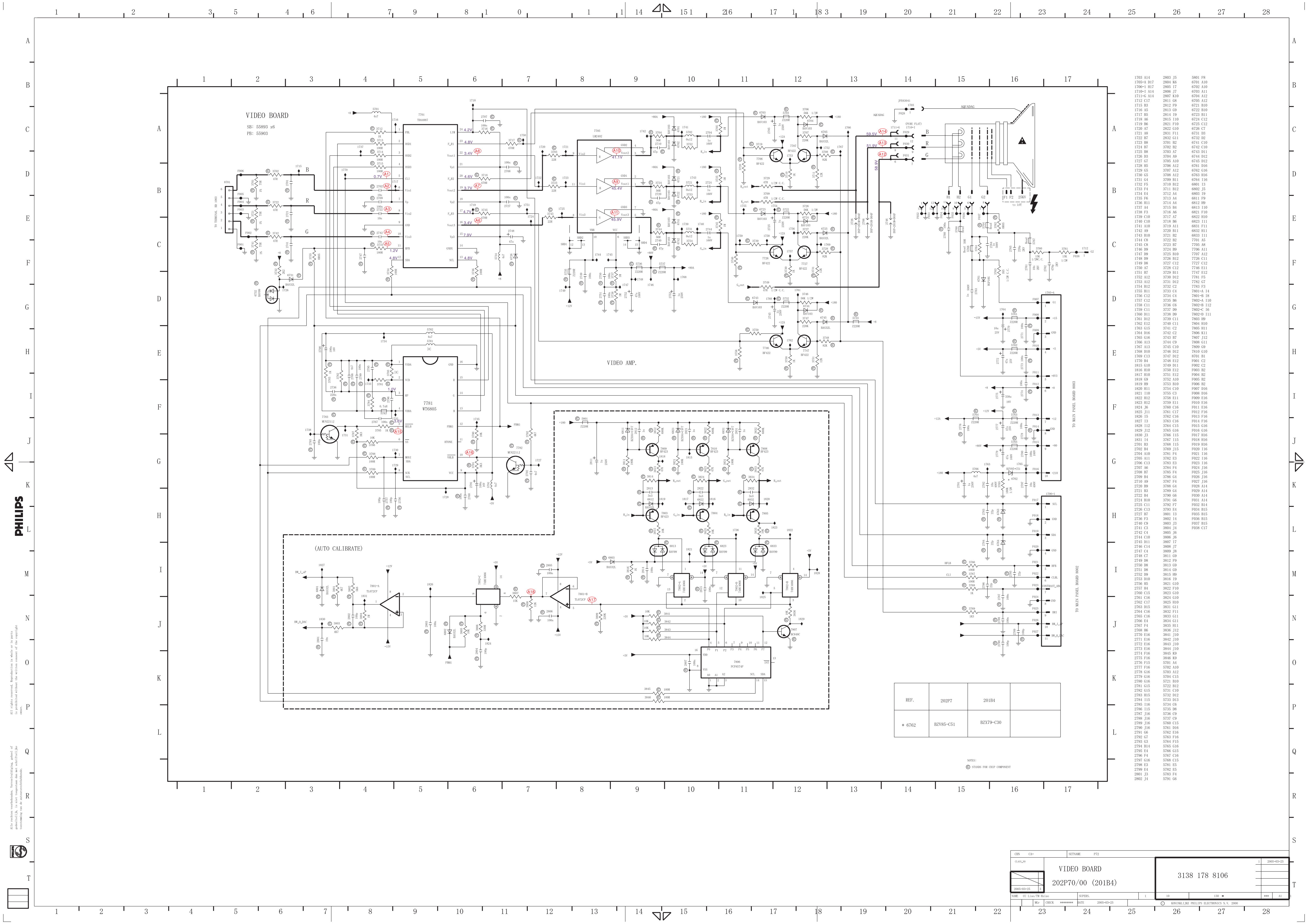
Main Board C.B.A.-2

Go to cover page



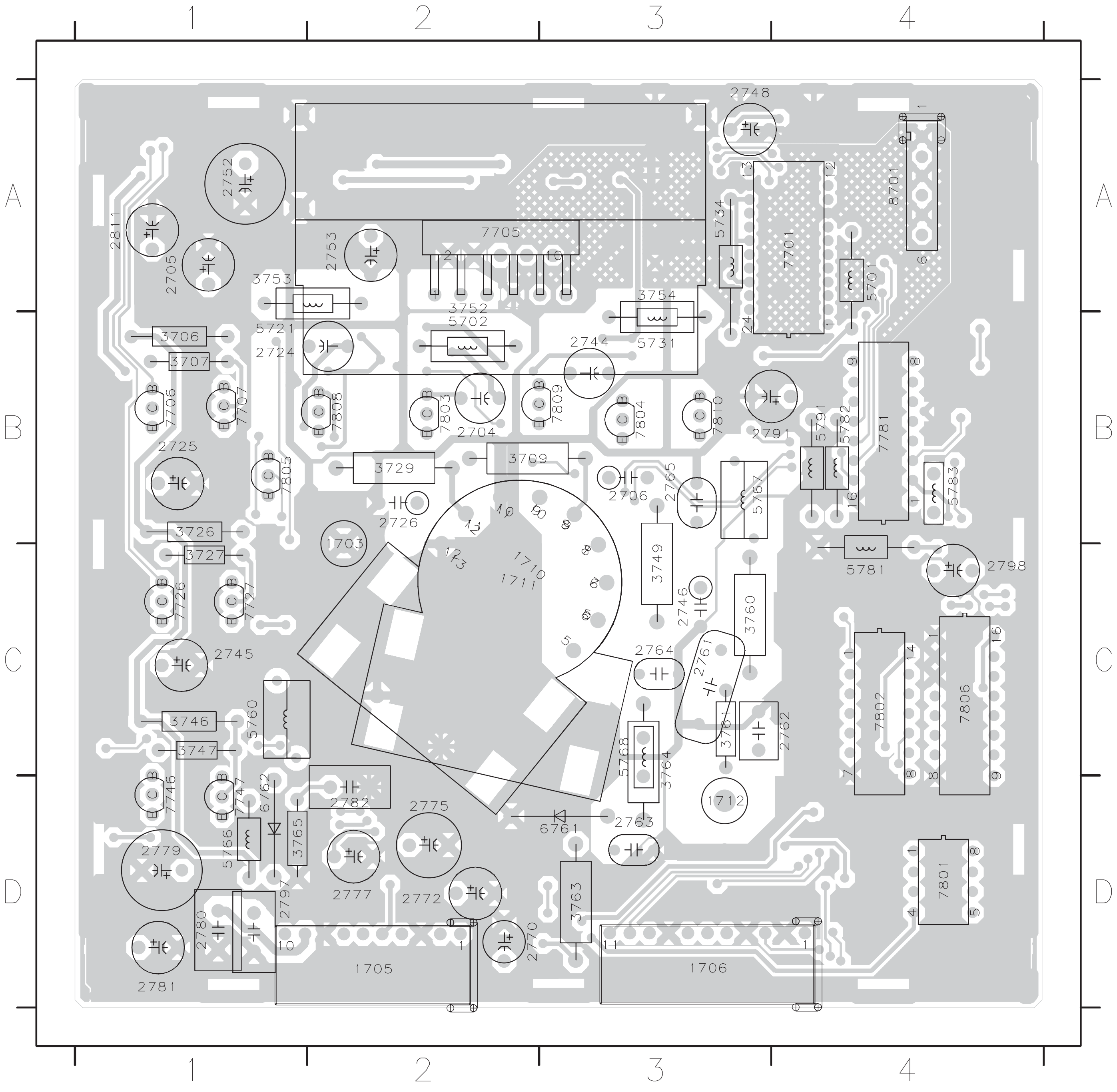
CN: ECO-002335	202P4		
CLASS NO. 3XX000	Driver Board CRT 202P4	3138 103 5924	3 2004-12-02 / ~~2 2004-02-17~~ / ~~1 2003-10-22~~
2003-10-22 (1, 2, 3)			
NAME CP Chou/Ivy Su	SUPERS 2	10 132 - 2	A3
CHECK	DATE 2003-10-22	© Philips Electronics N.V.	

Video Schematic Diagram



Video Board C.B.A.-1

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1703	B2	7747	D1
1705	D2	7781	B4
1706	D3	7801	D4
1710	C2	7802	C4
1711	C2	7803	B2
1712	D3	7804	B3
2704	B2	7805	B1
2705	A1	7806	C4
2706	B3	7808	B2
2724	B1	7809	B3
2725	B1	7810	B3
2726	B2	8701	A4
2744	B3		
2745	C1		
2746	C3		
2748	A3		
2752	A1		
2753	A2		
2761	C3		
2762	C4		
2763	D3		
2764	C3		
2765	B3		
2770	D2		
2772	D2		
2775	D2		
2777	D2		
2779	D1		
2780	D1		
2781	D1		
2782	D2		
2791	B3		
2797	D1		
2798	C4		
2811	A1		
3706	B1		
3707	B1		
3709	B2		
3726	B1		
3727	C1		
3729	B2		
3746	C1		
3747	C1		
3749	C3		
3752	A2		
3753	A1		
3754	A3		
3760	C3		
3761	C3		
3763	D3		
3764	C3		
3765	D1		
5701	A4		
5702	B2		
5721	B1		
5731	B3		
5734	A3		
5760	C1		
5766	D1		
5767	B3		
5768	C3		
5781	C4		
5782	B4		
5783	B4		
5791	B4		
6761	D3		
6762	D1		
7701	A4		
7705	A2		
7706	B1		
7707	B1		
7726	C1		
7727	C1		
7746	D1		

CN: ECO-002335 CRT 202

CLASS NO. 3XX000

Video Board
CRT 202 P4/P7

3138 103 5589

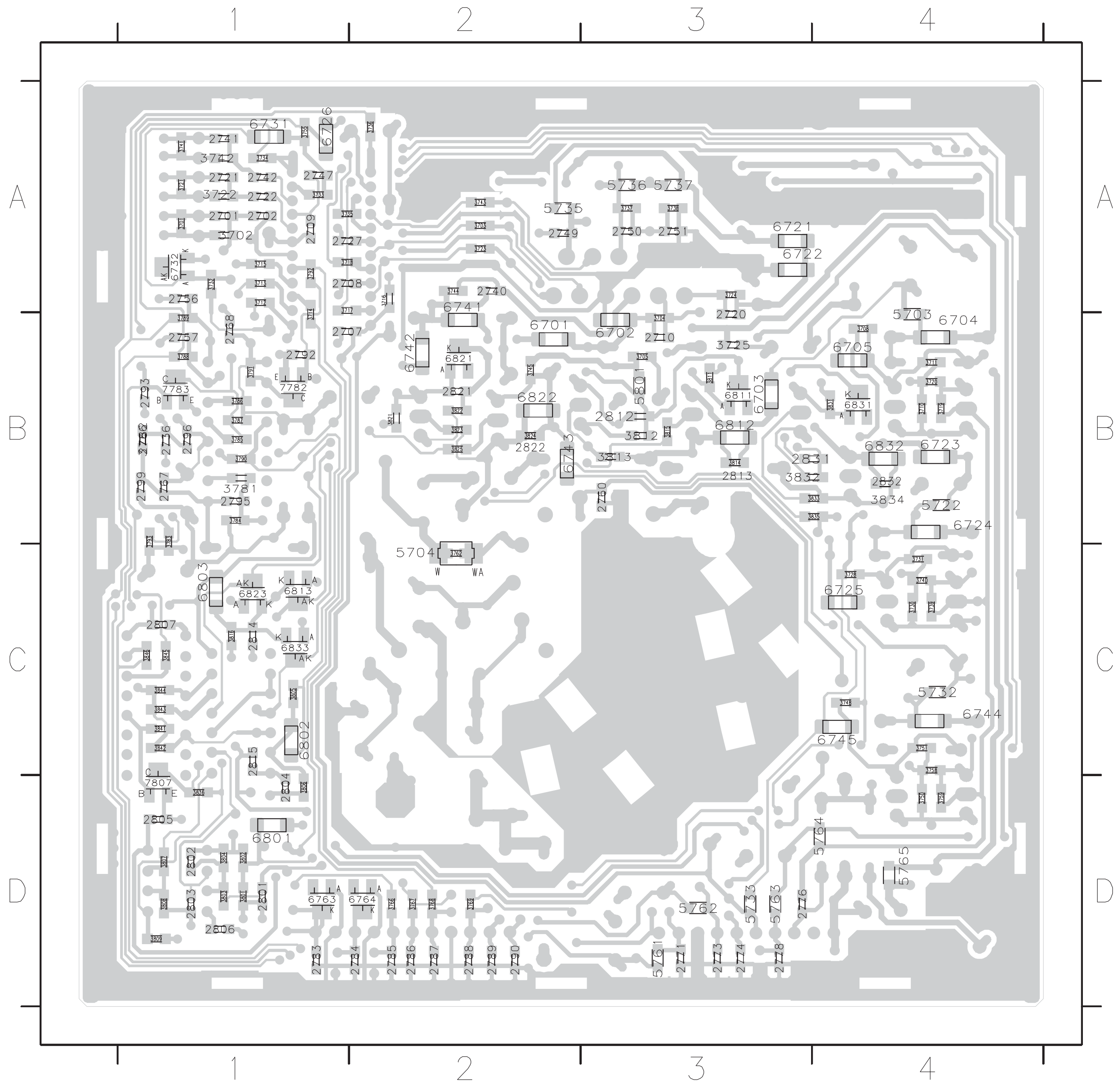
3 2004-12-02
2 2003-10-14
1 2002-01-18

2002-01-18

NAME CC Liao/Ivy Su SUPERS 2 10 132 - 1 A3

CHECK DATE 2002-01-18 © Philips Electronics N.V.

Video Board C.B.A.-2



2701	A1	3721	A1	3843	C1
2702	A1	3722	A1	3844	C1
2707	B1	3723	A2	3845	C1
2708	A1	3724	A3	3846	C1
2709	A1	3725	B3	5703	B4
2710	B3	3728	C4	5704	C2
2720	B3	3730	C4	5722	B4
2721	A1	3731	C4	5732	C4
2722	A1	3732	A1	5733	D3
2727	A1	3733	A1	5735	A2
2736	B1	3734	A1	5736	A3
2740	A2	3735	A1	5737	A3
2741	A1	3736	A2	5761	D3
2742	A1	3737	A3	5762	D3
2747	A1	3738	A3	5763	D3
2749	A2	3739	C4	5764	D4
2750	A3	3740	C4	5765	D4
2751	A3	3741	A1	5801	B3
2756	A1	3742	A1	6701	B2
2757	B1	3743	A2	6702	B3
2760	B3	3744	A2	6703	B3
2766	B1	3745	B2	6704	B4
2767	B1	3748	C4	6705	B4
2768	B1	3750	D4	6721	A3
2771	D3	3751	C4	6722	A3
2773	D3	3755	A1	6723	B4
2774	D3	3758	C4	6724	B4
2776	D3	3759	D4	6725	C4
2778	D3	3762	C2	6726	A1
2783	D1	3766	D2	6731	A1
2784	D2	3767	D2	6732	A1
2785	D2	3768	D2	6741	A2
2786	D2	3769	D2	6742	B2
2787	D2	3781	B1	6743	B2
2788	D2	3782	B1	6744	C4
2789	D2	3783	B1	6745	C4
2790	D2	3784	B1	6763	D1
2792	B1	3785	B1	6764	D2
2793	B1	3786	B1	6801	D1
2795	B1	3787	B1	6802	C1
2796	B1	3788	B1	6803	C1
2799	B1	3789	B1	6811	B3
2801	D1	3790	B1	6812	B3
2802	D1	3791	B1	6813	C1
2803	D1	3792	A1	6821	B2
2804	D1	3793	B1	6822	B2
2805	D1	3801	D1	6823	C1
2806	D1	3802	D1	6831	B4
2807	C1	3803	D1	6832	B4
2812	B3	3804	D1	6833	C1
2813	B3	3805	C1	7782	B1
2814	C1	3806	D1	7783	B1
2815	C1	3807	D1	7807	D1
2821	B2	3808	D1		
2822	B2	3809	D1		
2831	B3	3811	B3		
2832	B4	3812	B3		
3701	A1	3813	B3		
3702	A1	3814	B3		
3703	A2	3815	B3		
3704	B3	3816	C1		
3705	B3	3821	B2		
3708	B4	3822	B2		
3710	B4	3823	B2		
3711	B4	3824	B2		
3712	A1	3825	B2		
3713	A1	3831	B4		
3714	B1	3832	B3		
3715	A1	3833	B4		
3716	A2	3834	B4		
3717	A1	3835	B4		
3718	A1	3836	D1		
3719	B4	3841	C1		
3720	B4	3842	C1		

CN: ECO-002335 CRT 202

CLASS NO. 3XX000

Video Board
CRT 202 P4/P7

3138 103 5589

3 2004-12-02
2 2003-10-14
1 2002-01-18

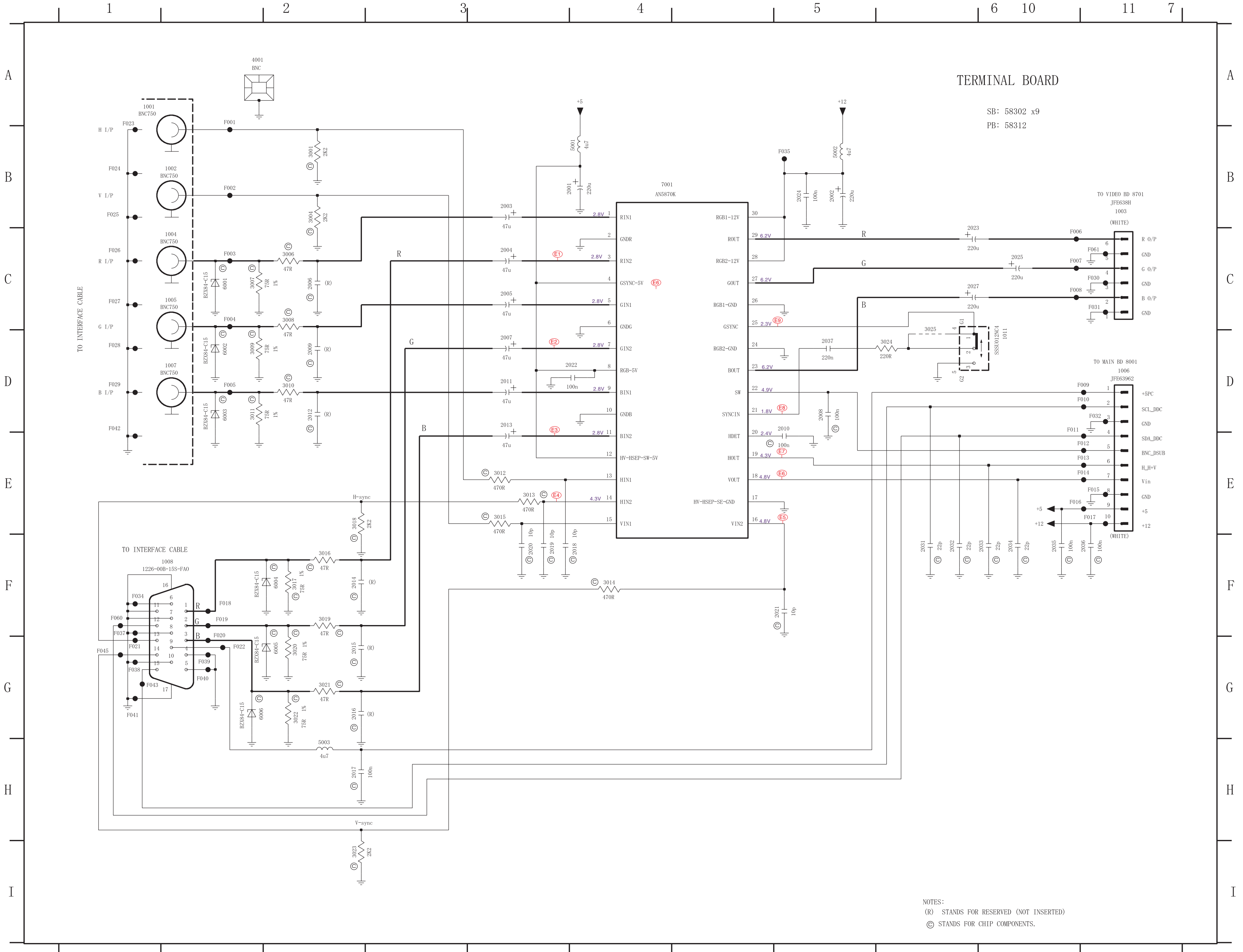
2002-01-18

NAME CC Liao/Ivy Su SUPERS 2 10 132 - 2 A3

CHECK DATE 2002-01-18 © Philips Electronics N.V.

TERMINAL Schematic Diagram

Go to cover page

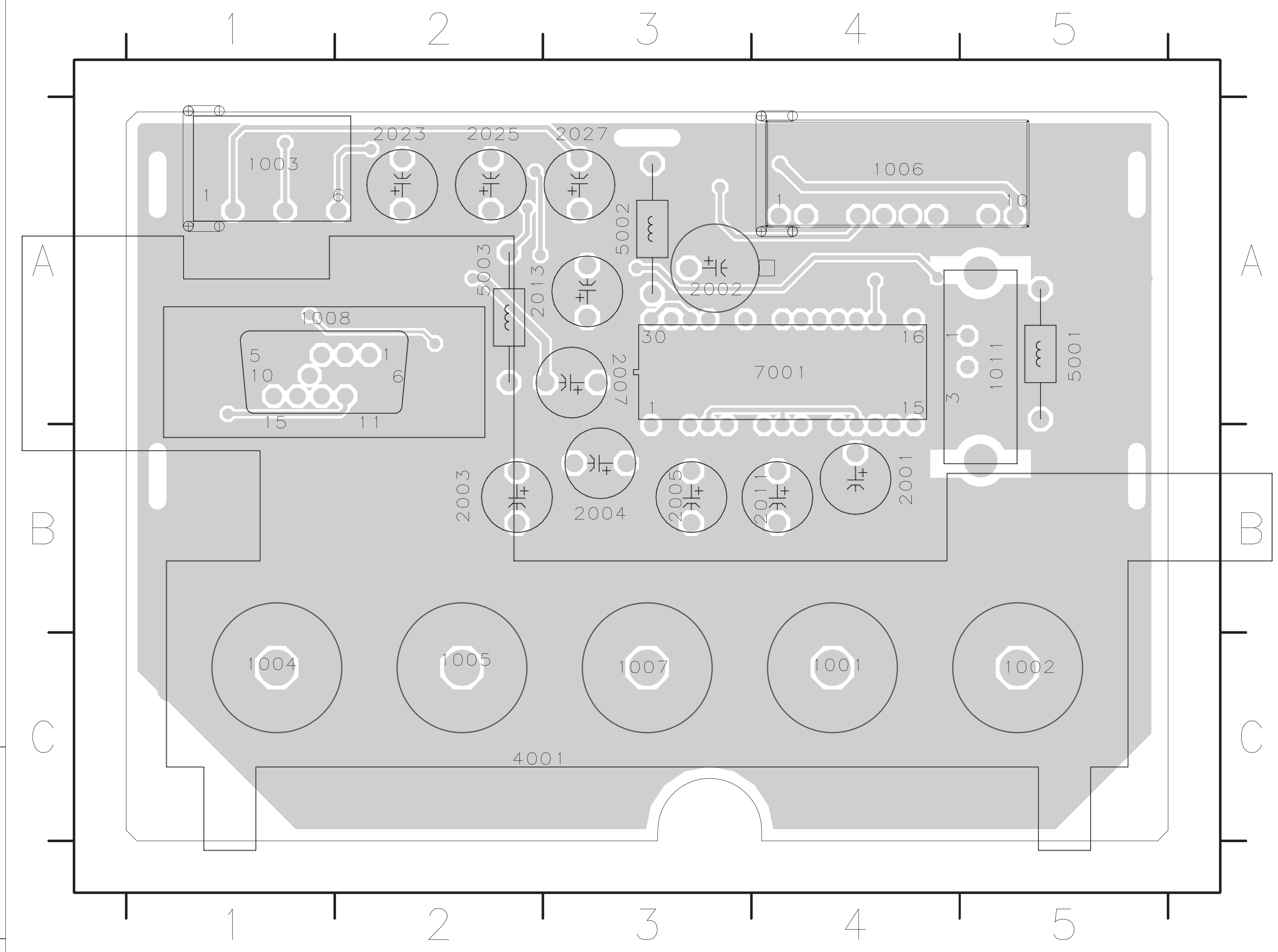


1001 A1	2004 C5	2031 F9	3012 E5	6001 C2	F010 D11	F027 C1	F045 G1
1002 B2	2005 C5	2032 F9	3013 E5	6002 D2	F011 D10	F028 D1	F060 F1
1003 B11	2006 C3	2033 F10	3014 F6	6003 D2	F012 E11	F029 D1	F061 C11
1004 C2	2007 D5	2034 F10	3015 E5	6004 F3	F013 E11	F030 C11	
1005 C2	2008 D8	2035 F10	3016 F3	6005 G3	F014 E11	F031 C11	
1006 D11	2009 D3	2036 F11	3017 F3	6006 G2	F015 E11	F032 D11	
1007 D2	2010 D8	2037 D8	3018 E3	7001 B6	F016 E10	F034 F1	
1008 F2	2011 D5	3001 B3	3019 F3	F001 A2	F017 E11	F035 B8	
1011 C10	2012 D3	3004 B3	3020 G3	F002 B2	F018 F2	F037 F1	
2001 B6	2013 D5	3006 C3	3021 G3	F003 C2	F019 F2	F038 G1	
2002 B8	2014 F3	3007 C2	3022 G3	F004 C2	F020 G2	F039 G2	
2003 B5	2015 G3	3008 C3	3023 I3	F005 D2	F021 G1	F040 G2	
	2016 G3	3009 D2	3024 D9	F006 C10	F022 G2	F041 G1	
	2017 H3	3010 D3	3025 D9	F007 C10	F023 A1	F042 D1	
	2018 F6	3011 D2	4001 A2	F008 C10	F024 B1	F043 G1	
	2019 F5		5001 B6	F009 D11	F025 B1		
	2020 F5		5002 B8		F026 C1		
	2021 F8		5003 H3				
	2022 D6						
	2023 C9						
	2024 B8						
	2025 C10						
	2027 C9						

TERMINAL
202P70/00
3138 178 8116
NAME CC Liao
DATE 2005-03-25

PHILIPS

TERMINAL Board C.B.A.-1



1001	C4
1002	C5
1003	A1
1004	C1
1005	C2
1006	A4
1007	C3
1008	A1
1011	A5
2001	B4
2002	A3
2003	B2
2004	B3
2005	B3
2007	A3
2011	B4
2013	A2
2023	A2
2025	A2
2027	A3
4001	C2
5001	A5
5002	A3
5003	A2
7001	A4

CN: ECO-002335 CRT 202

CLASS NO. 3XX000

Terminal Board
CRT 202 P4/P7

3138 103 5830

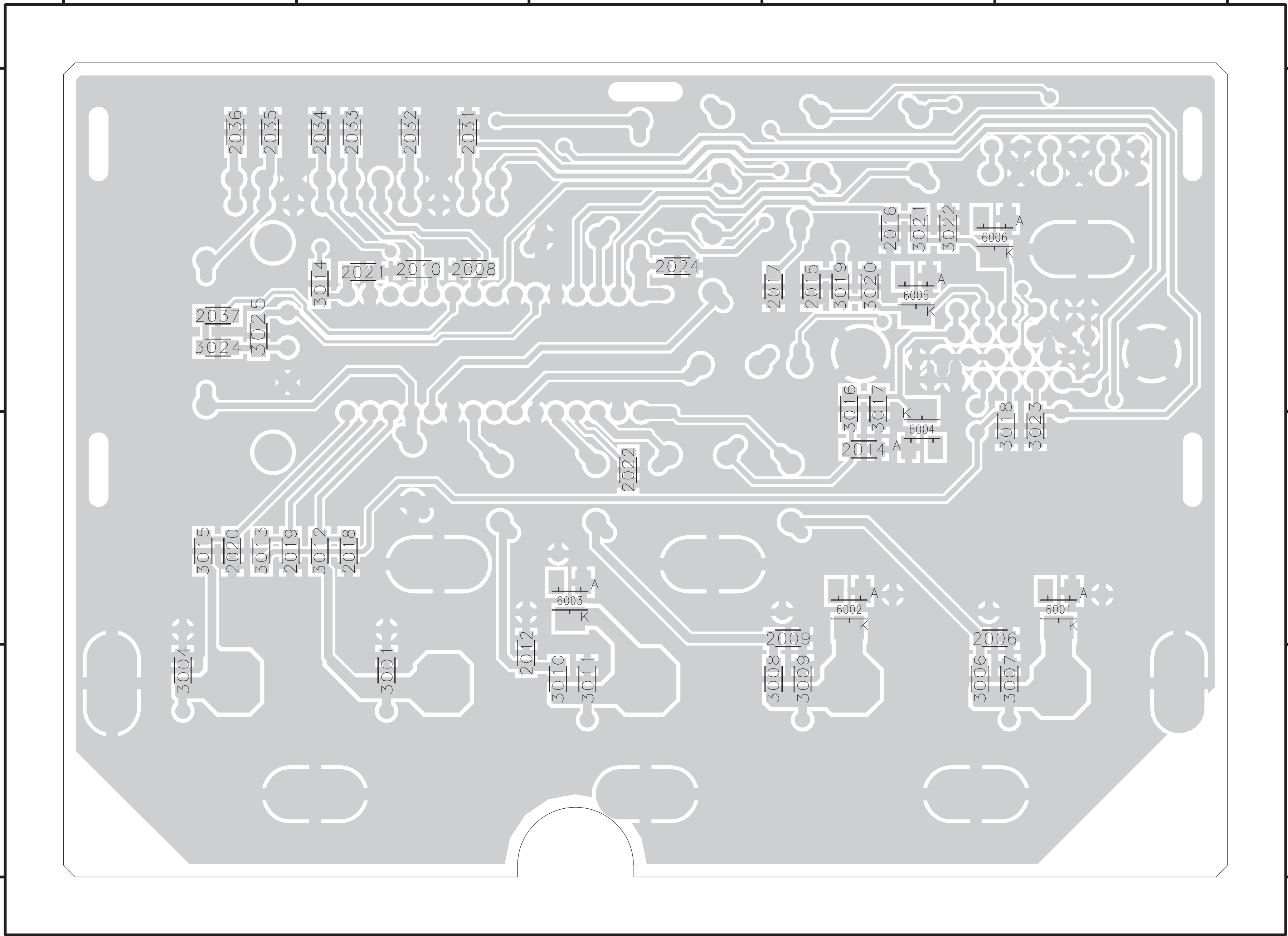
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NAME CC Lioa/Hsiao SUPERS 2 10 132 - 1 A3

CHECK DATE 2003-06-30 © Philips Electronics N.V.

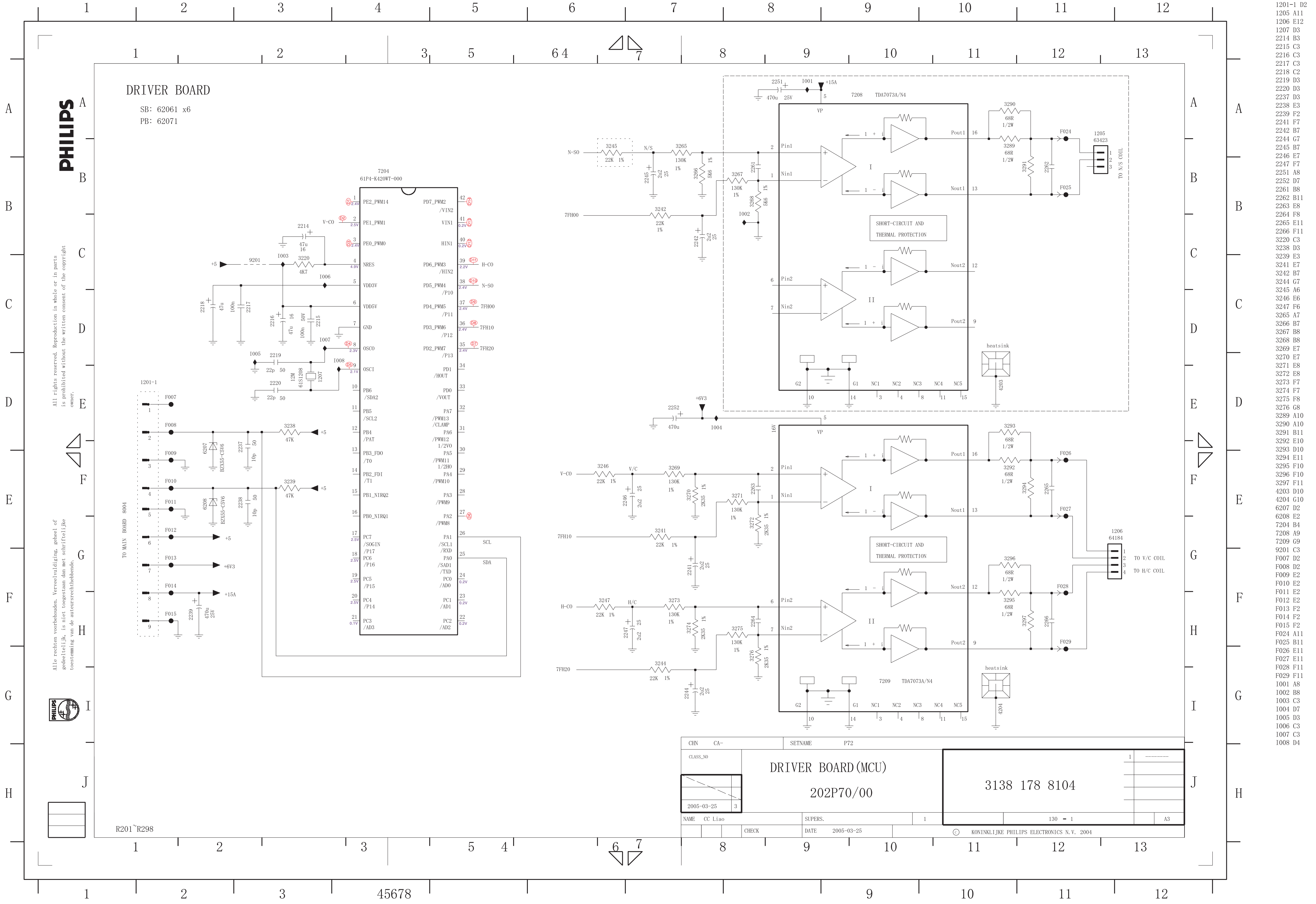
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2014	B4		
2015	A4		
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2018	B2		
2019	B1		
2020	B1		
2021	A2		
2022	B3		
2024	A3		
2031	A2		
2032	A2		
2033	A2		
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2036	A1		
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3004	C1		
3006	C4		
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3009	C4		
3010	C3		
3011	C3		
3012	B2		
3013	B1		
3014	A2		
3015	B1		
3016	A4		
3017	A4		
3018	B5		
3019	A4		
3020	A4		
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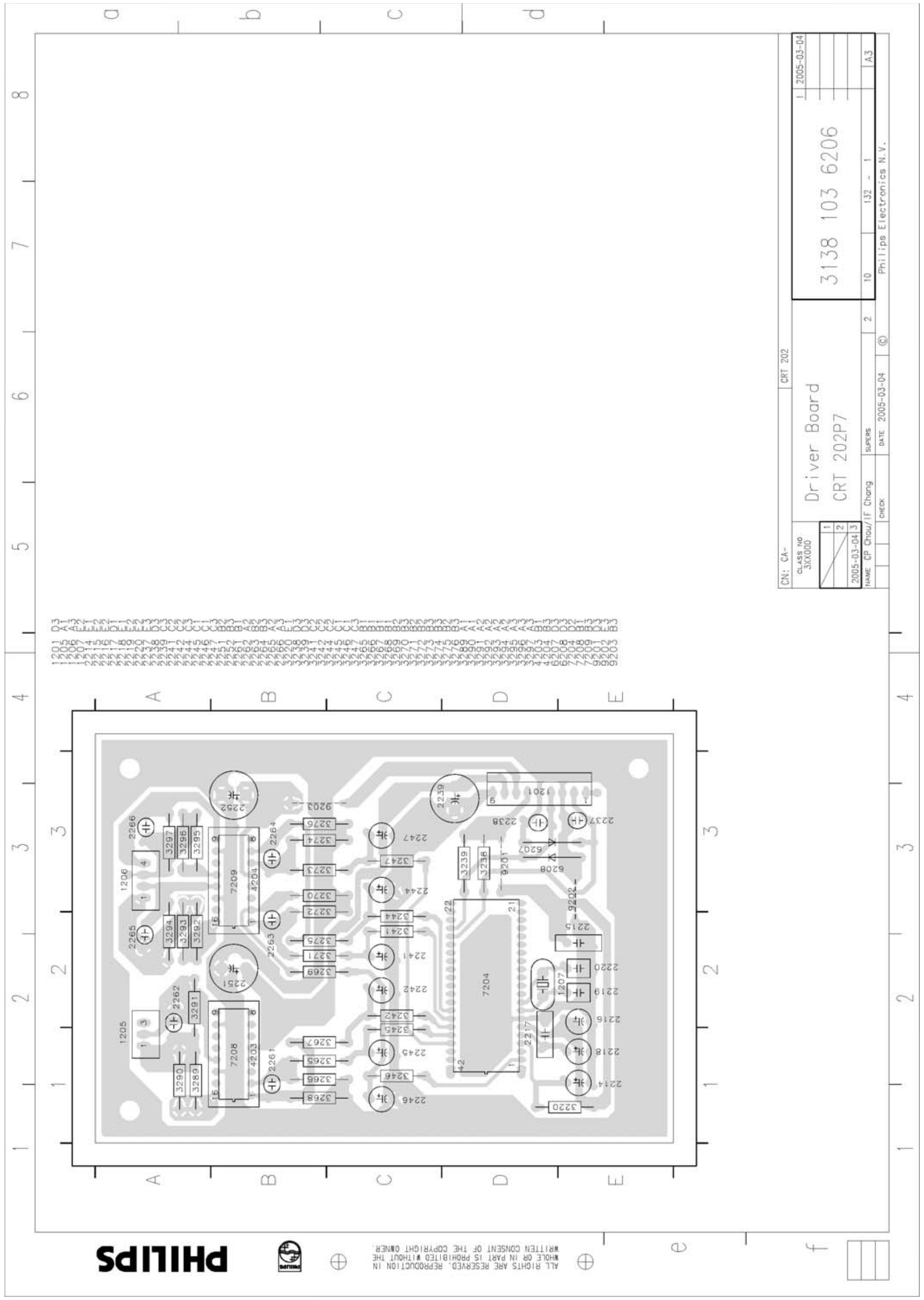
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Terminal Board
CRT 202 P4/P7
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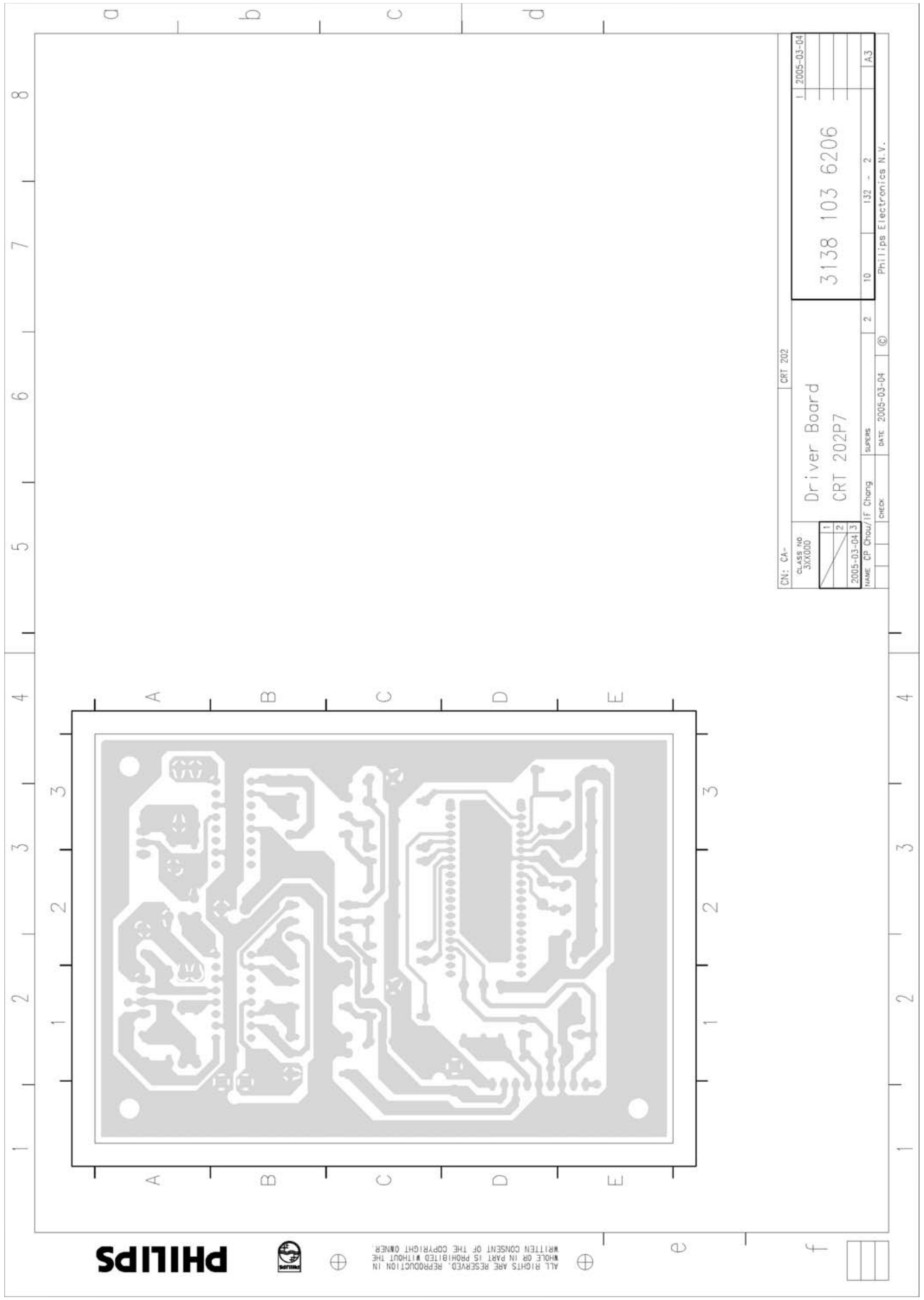
Driver Schematic Diagram



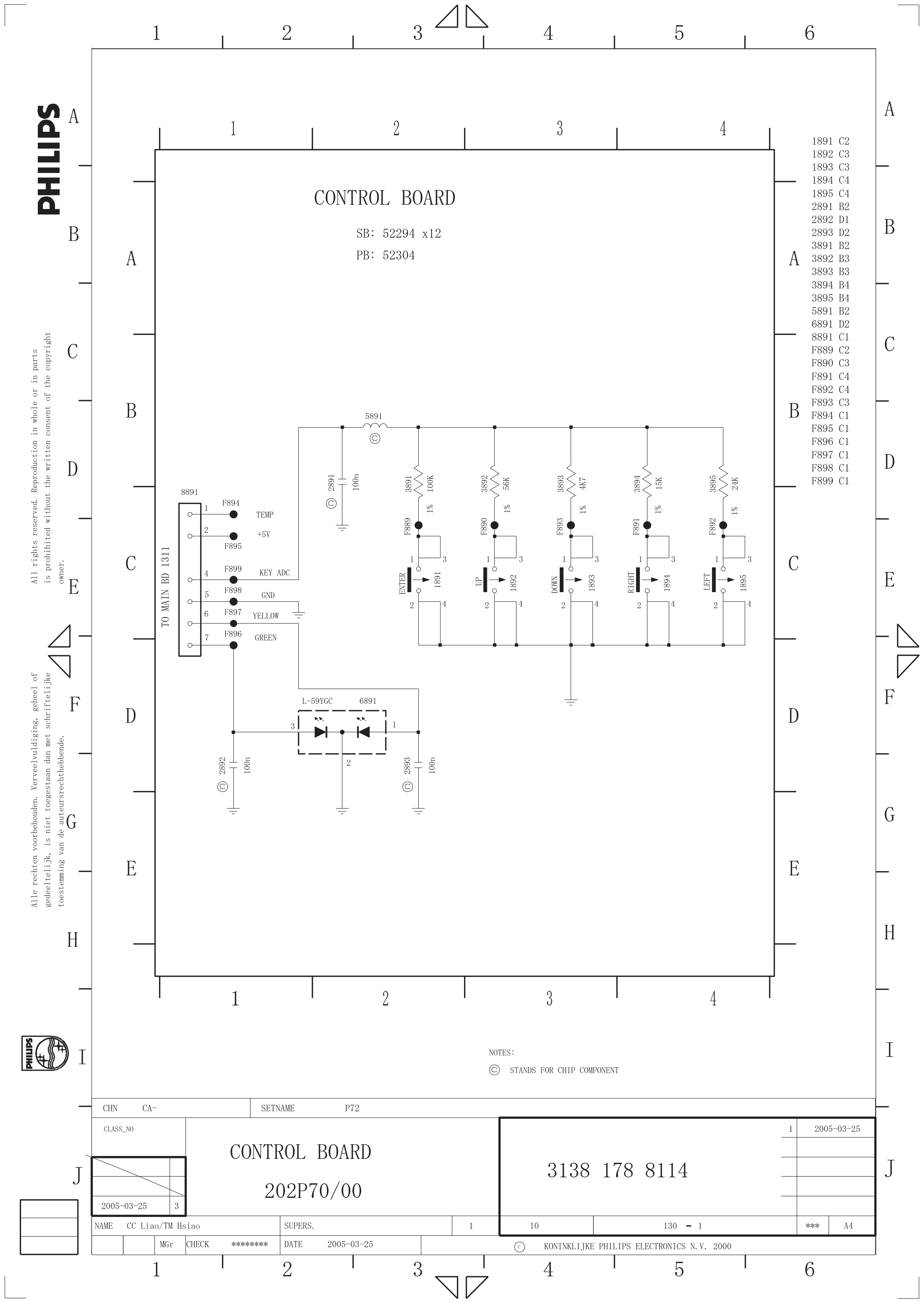
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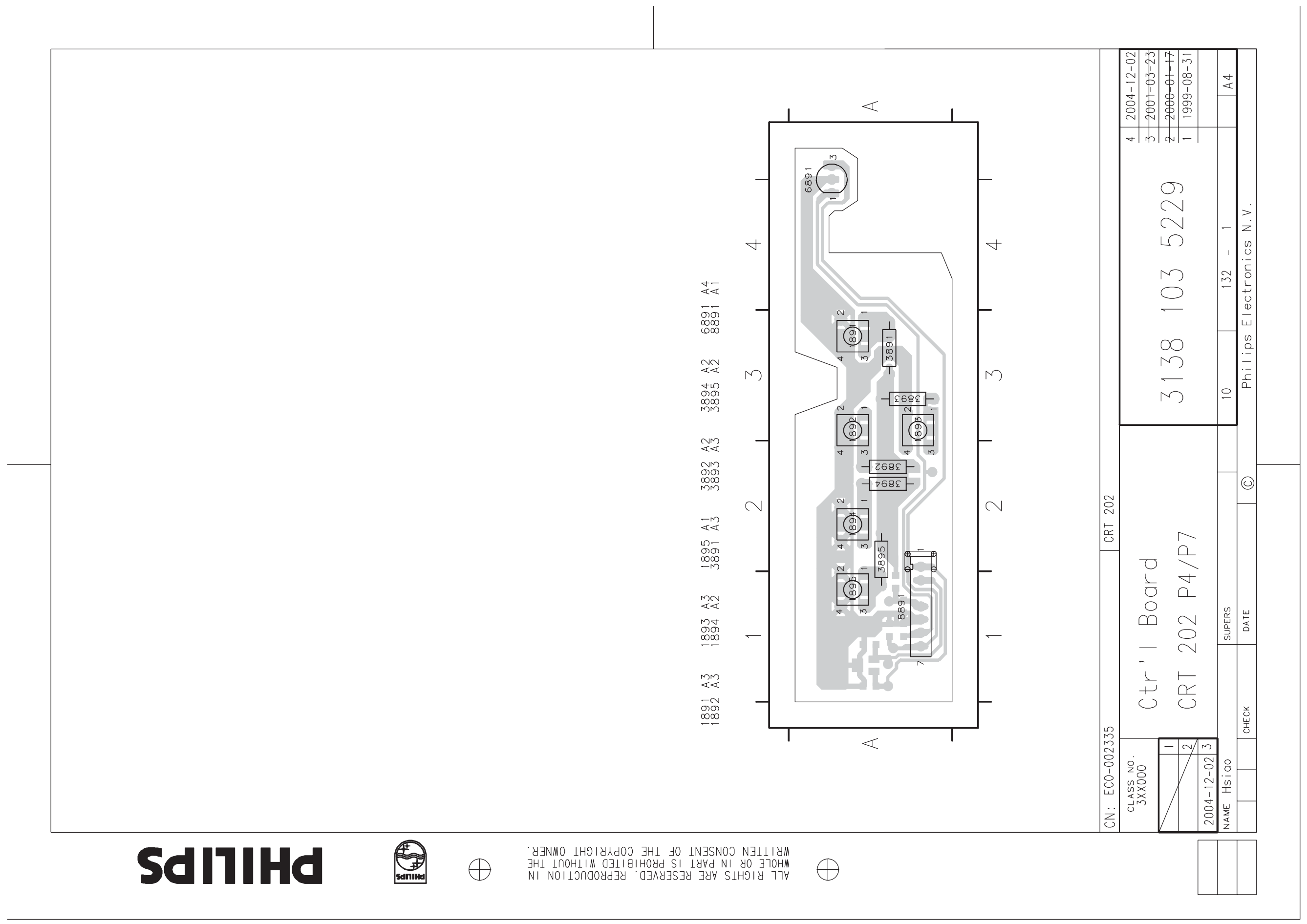
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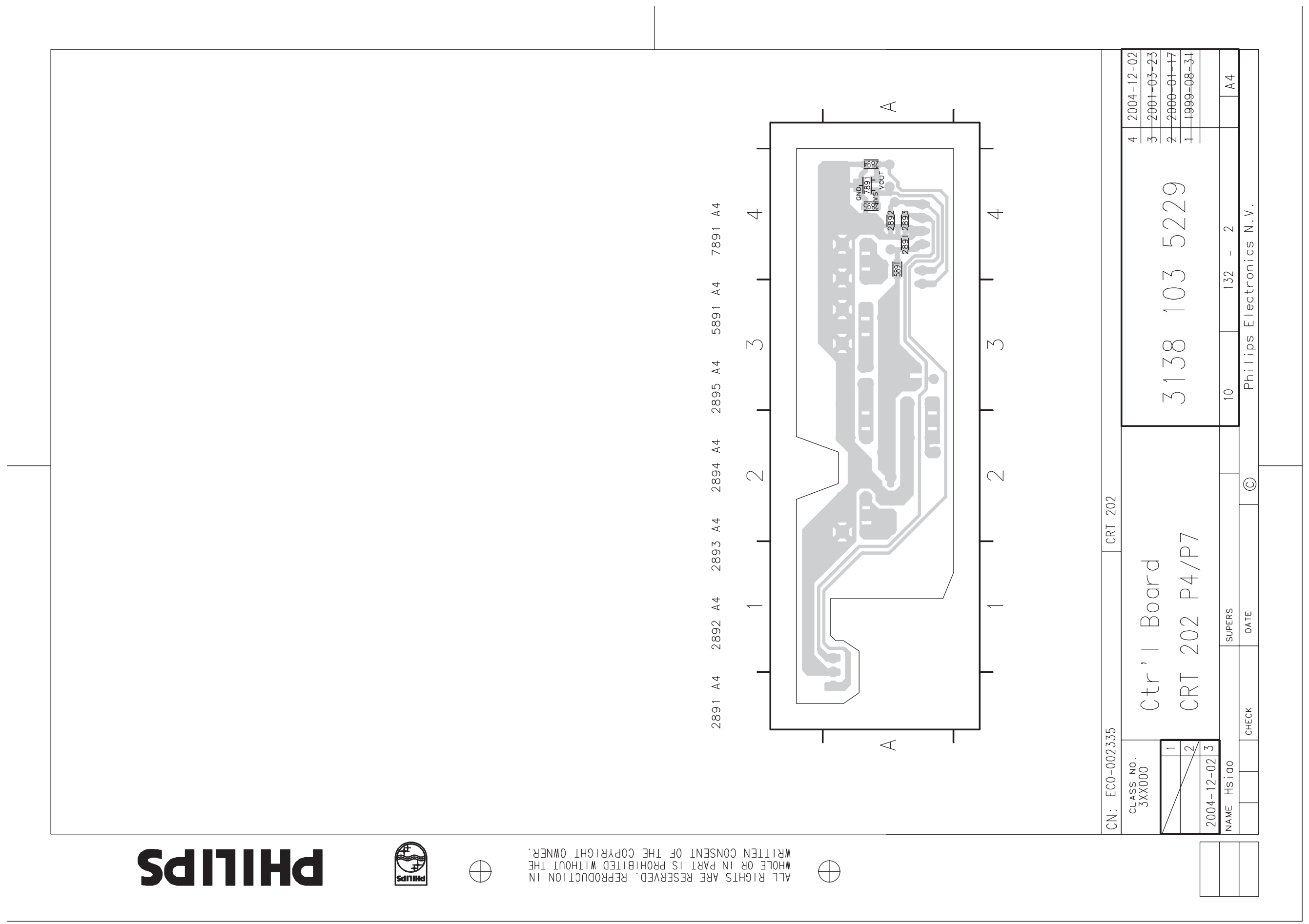




KEY CONTROL Schematic Diagram&C.B.A.

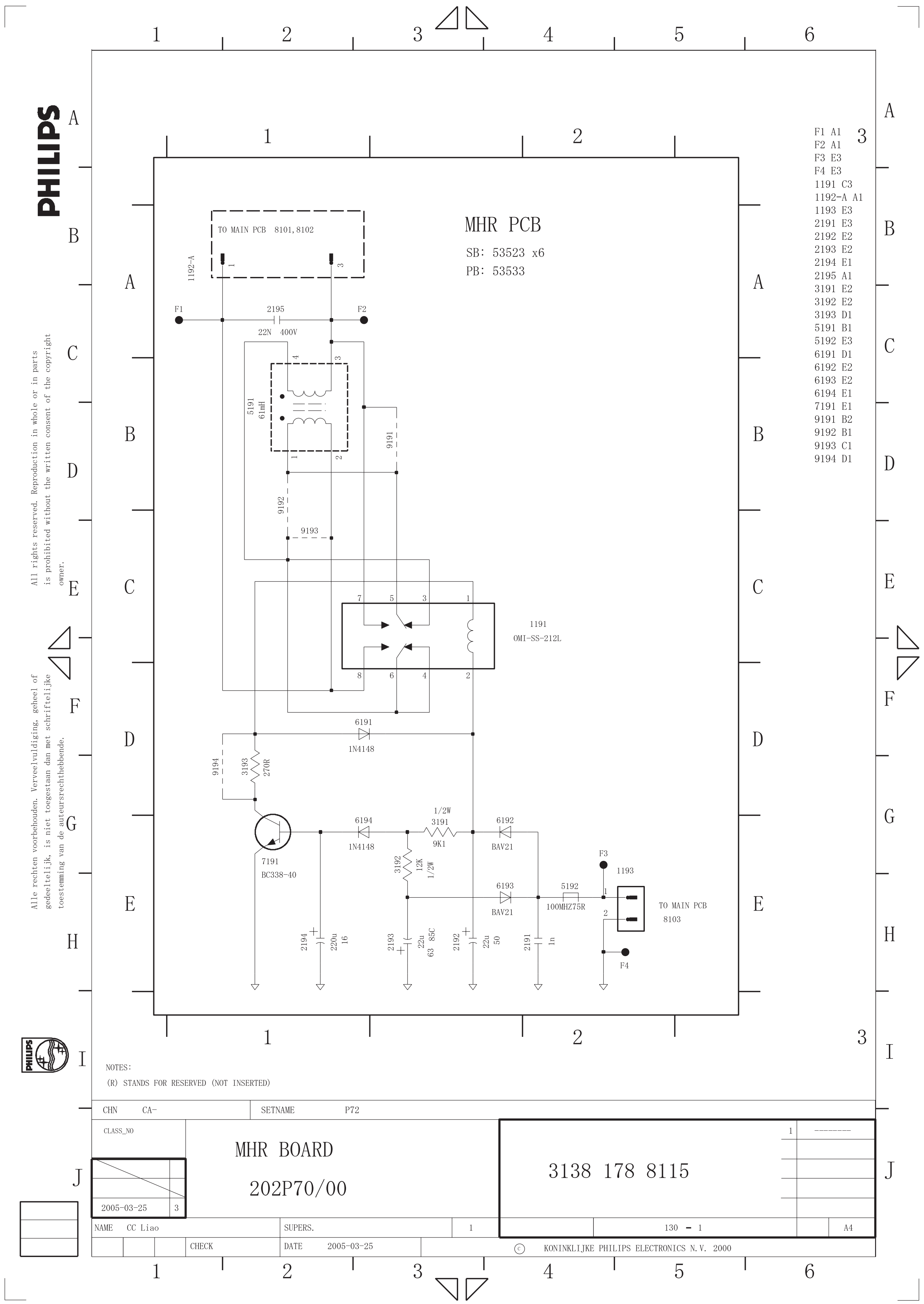


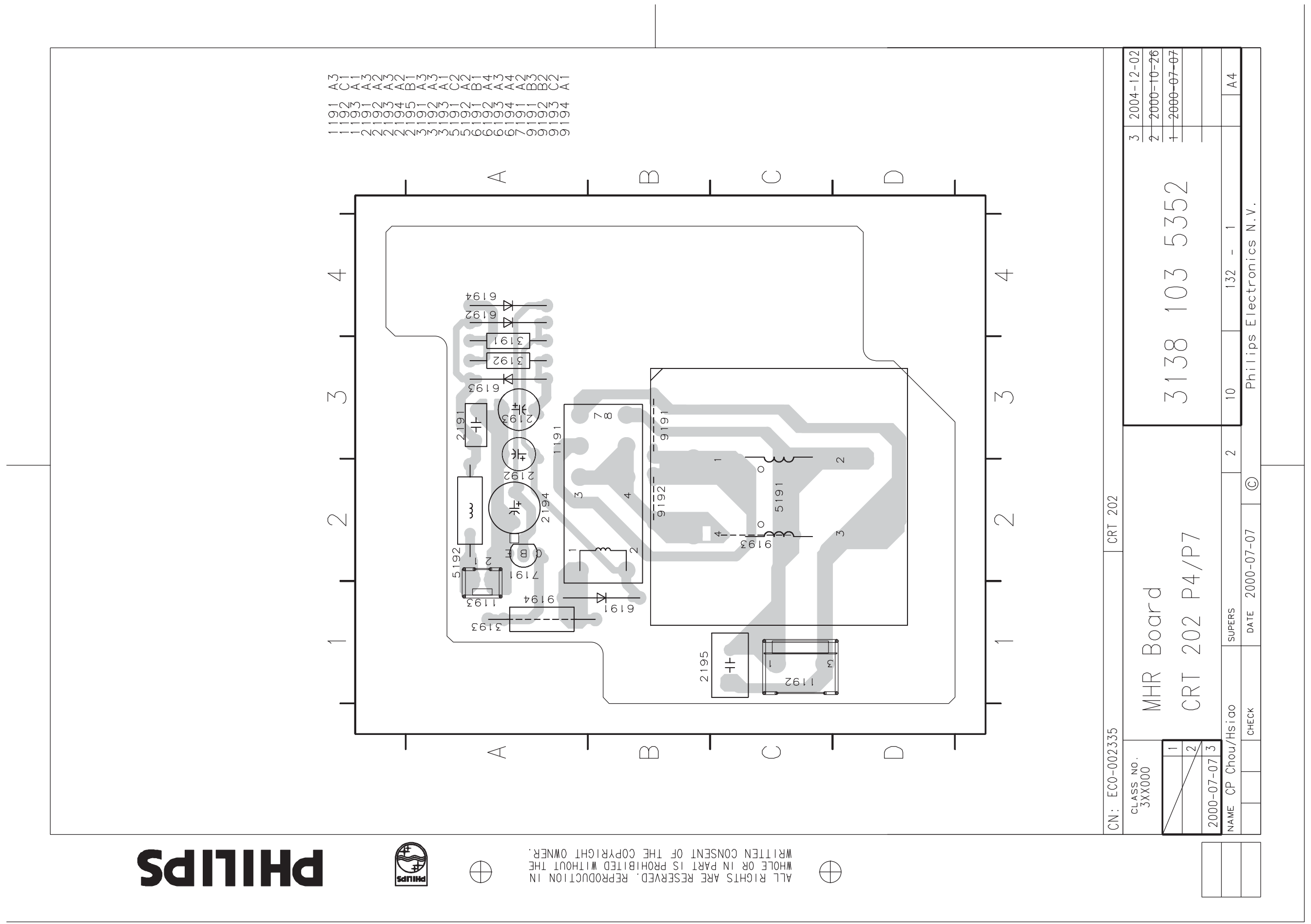


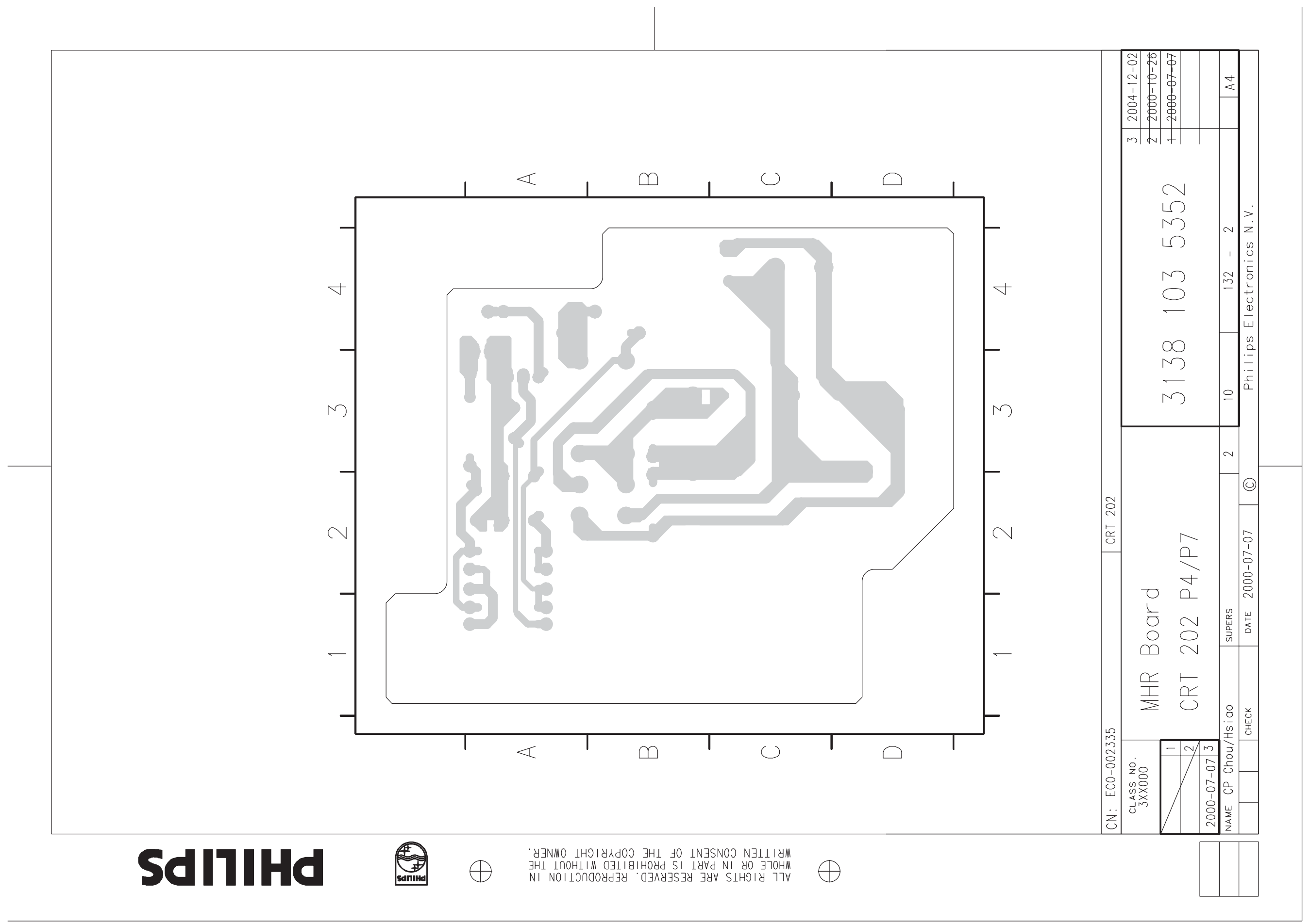


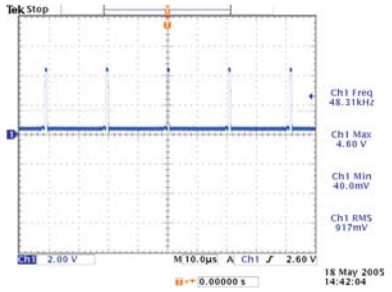
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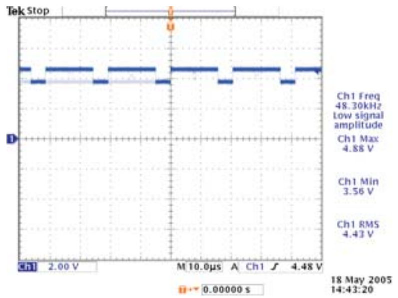
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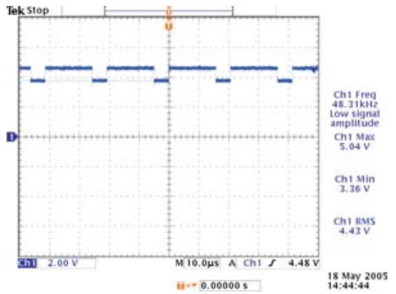


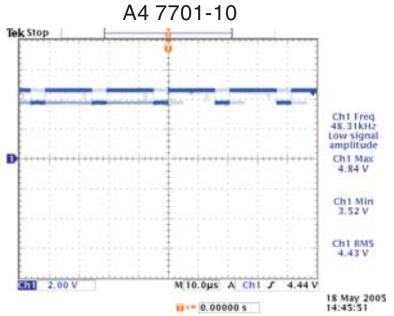


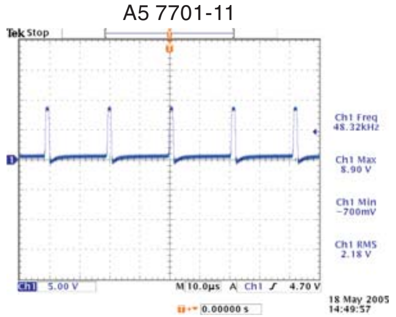


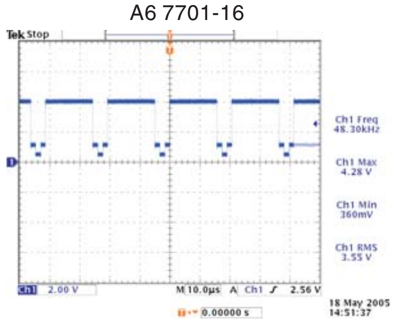
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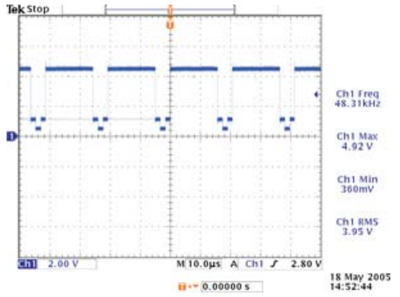
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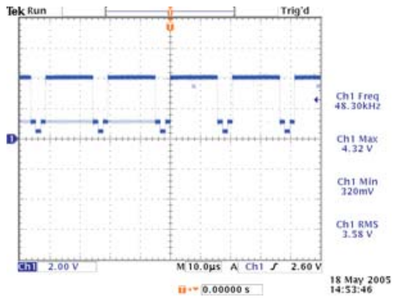
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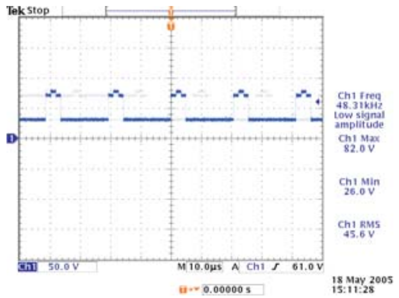
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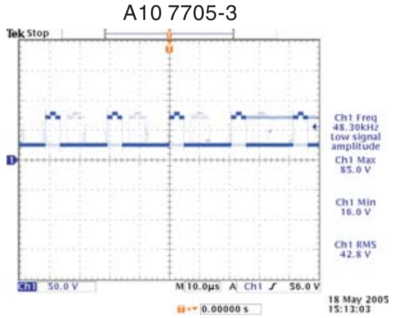
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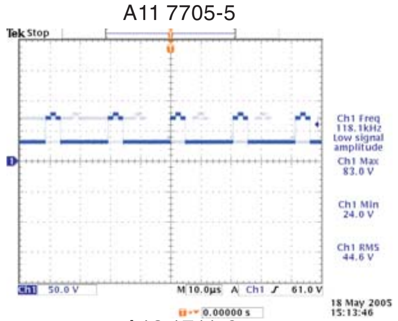
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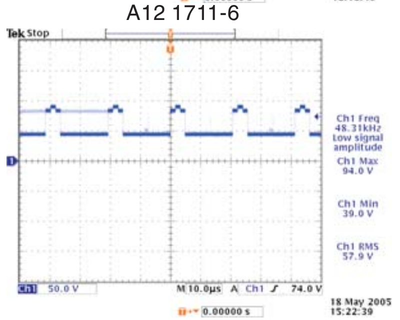
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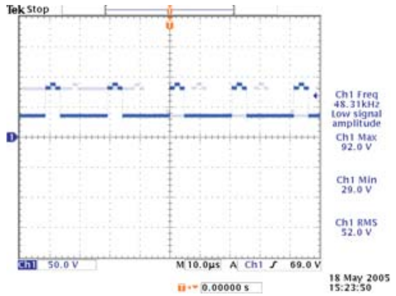
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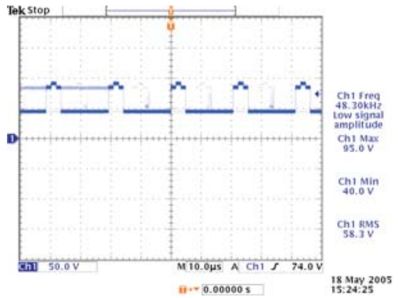
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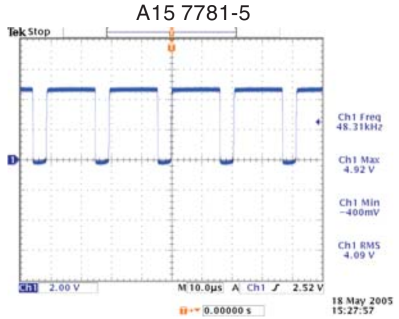
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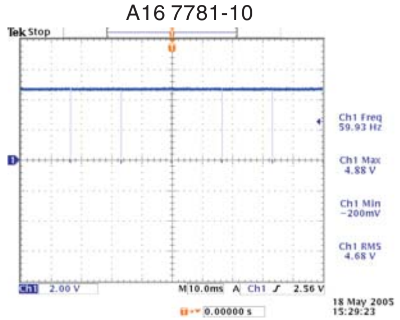
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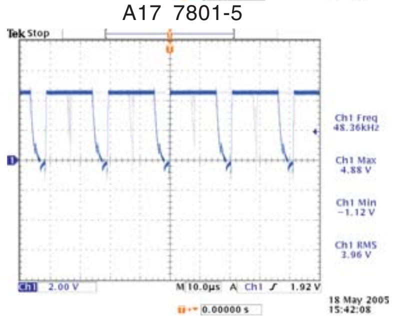
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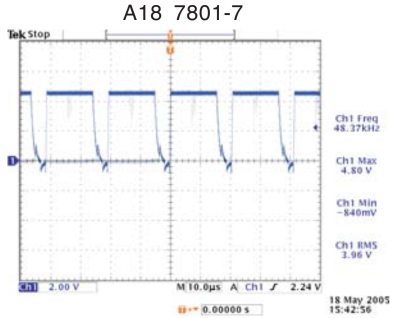
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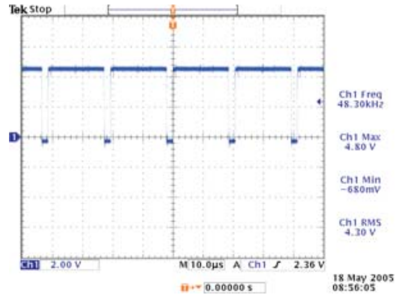
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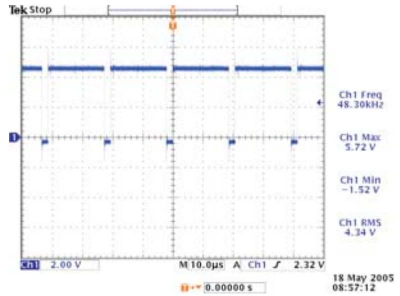
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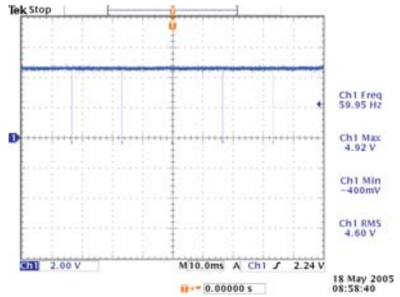
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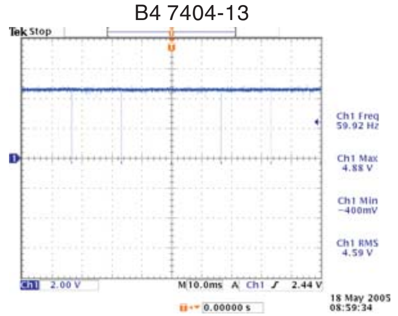
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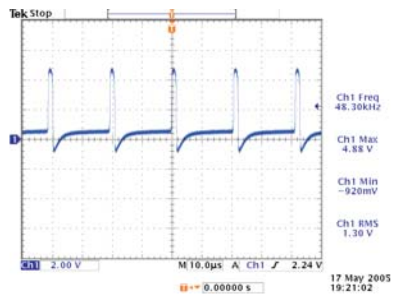
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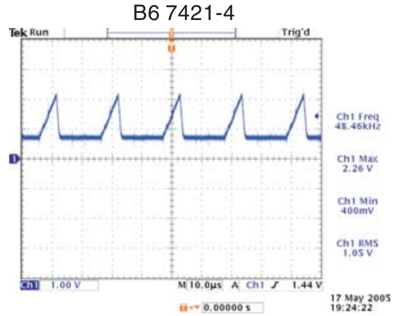
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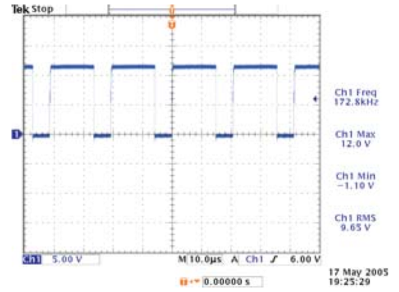
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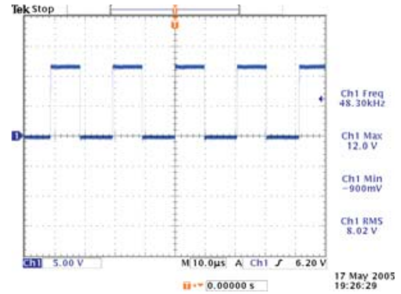
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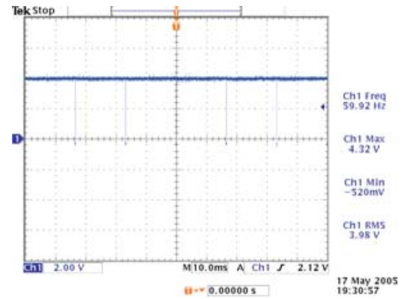
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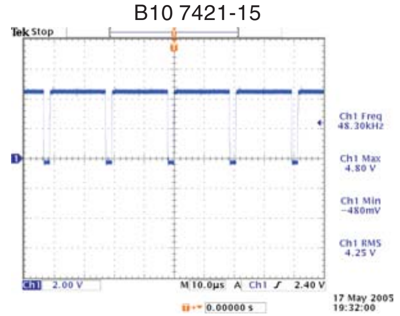
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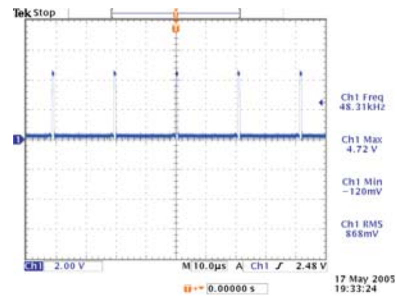
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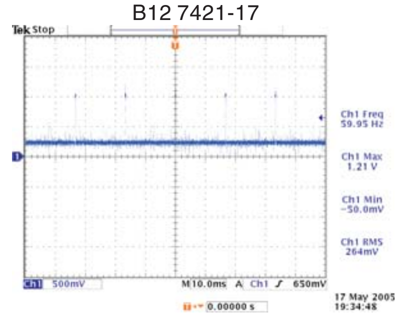
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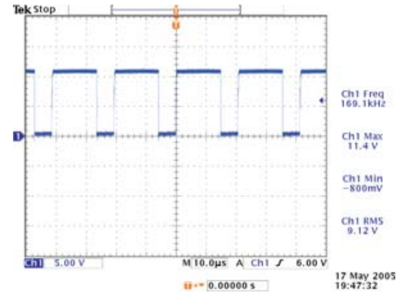
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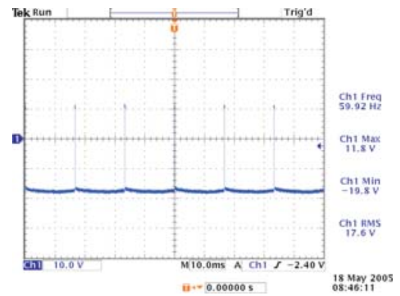
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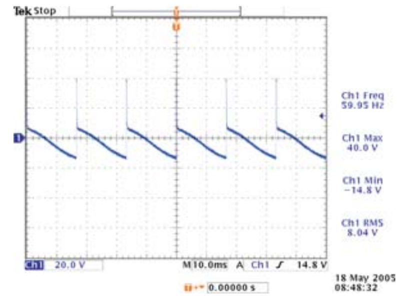
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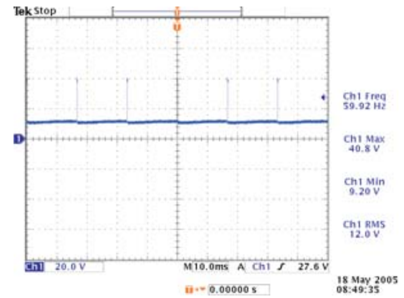
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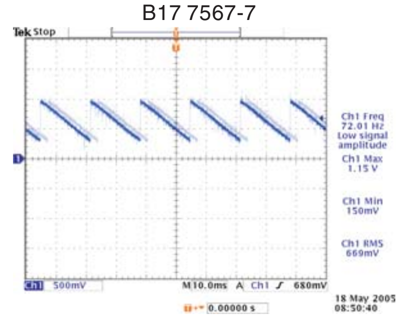
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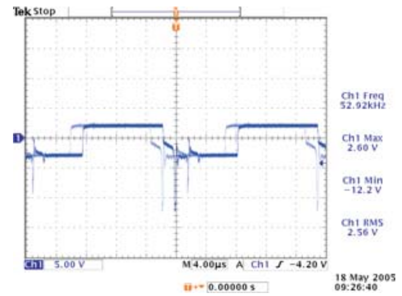
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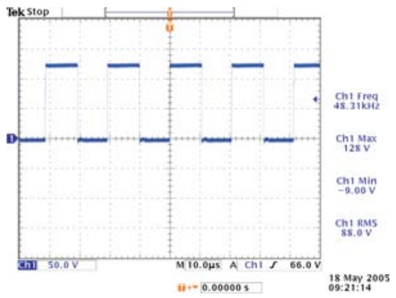
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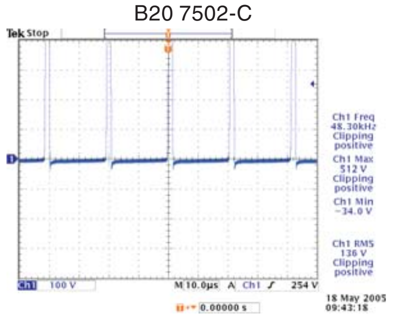
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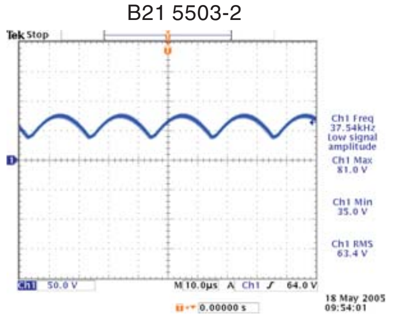
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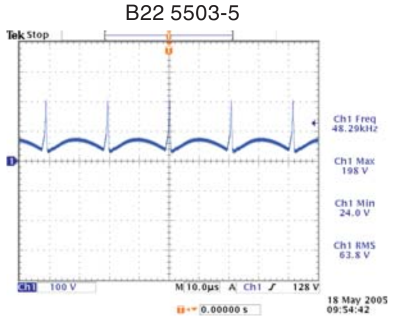
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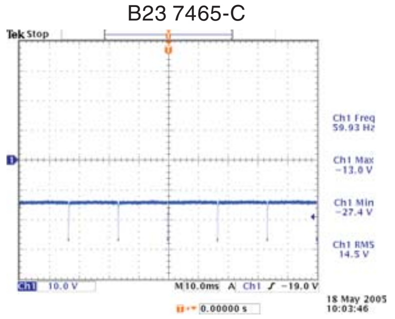
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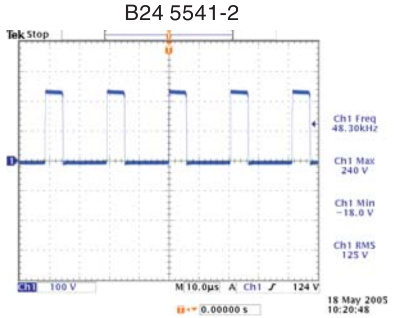
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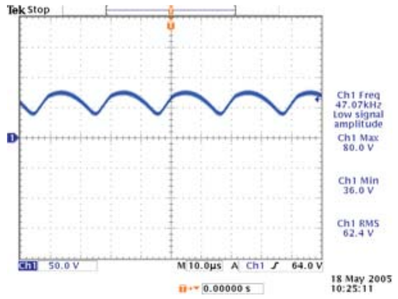
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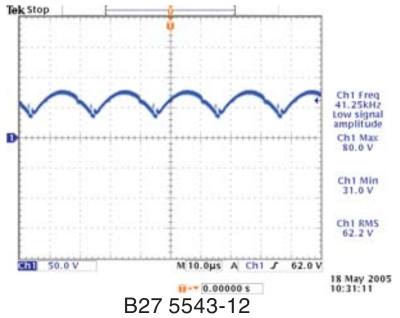
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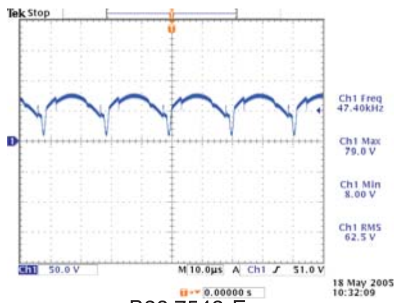
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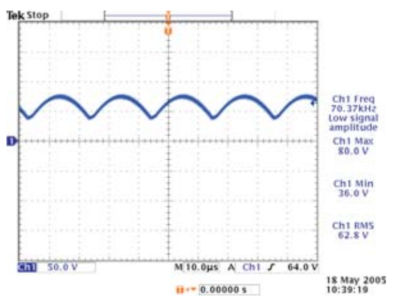
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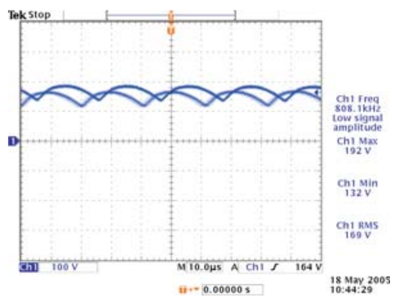
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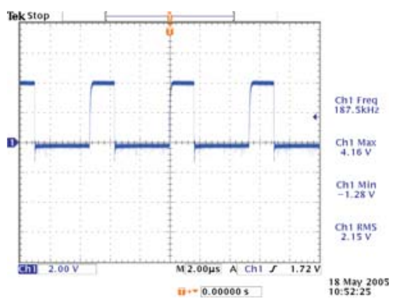
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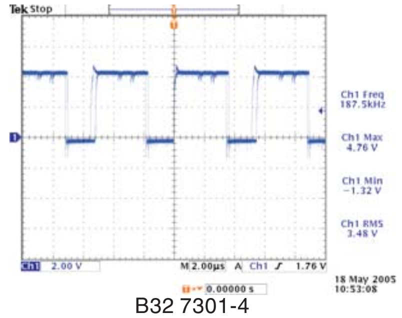
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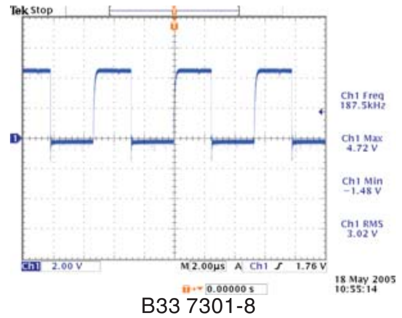
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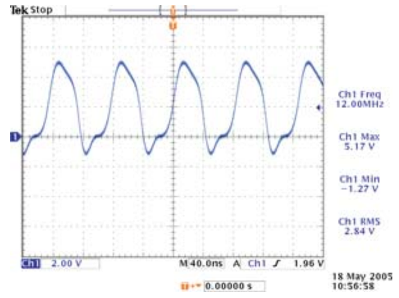
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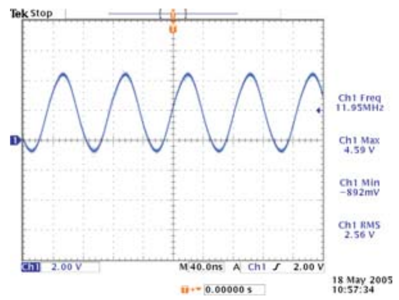
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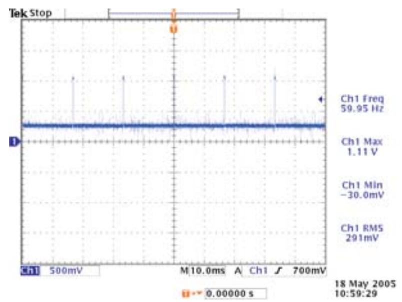
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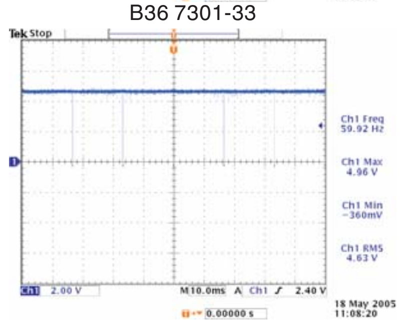
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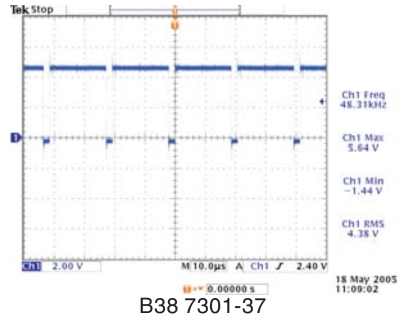
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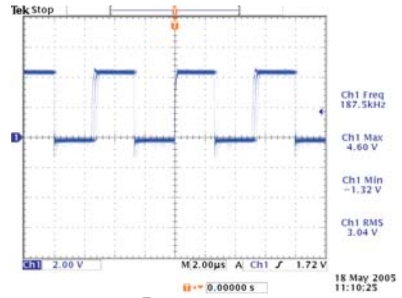
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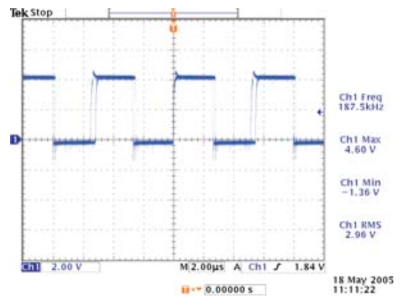
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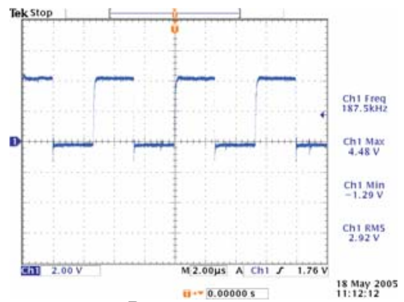
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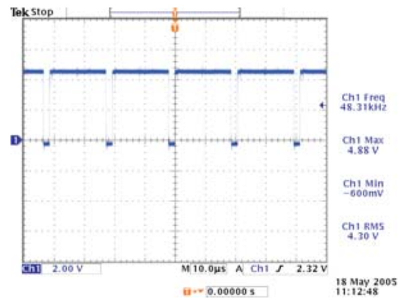
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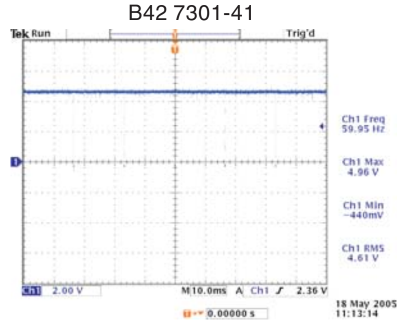
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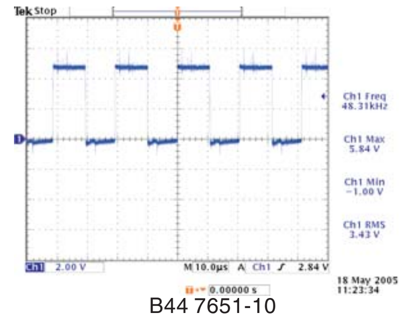
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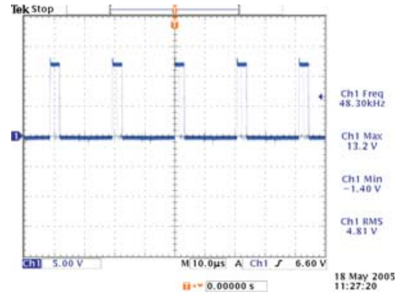
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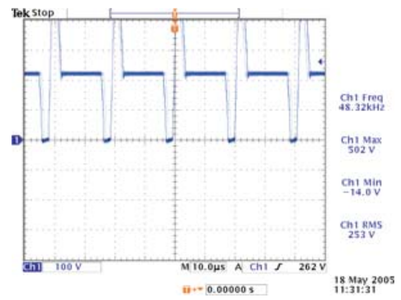
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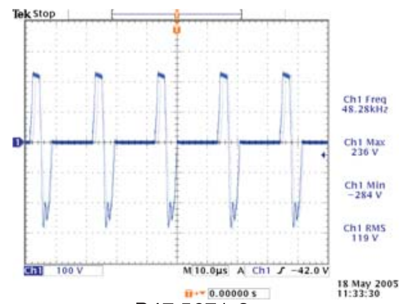
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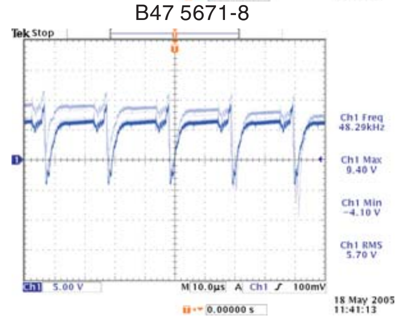
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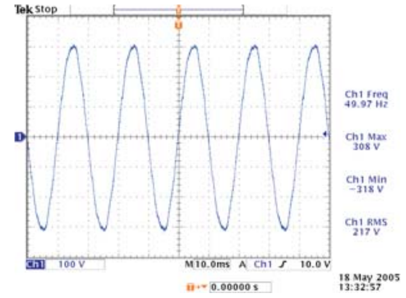
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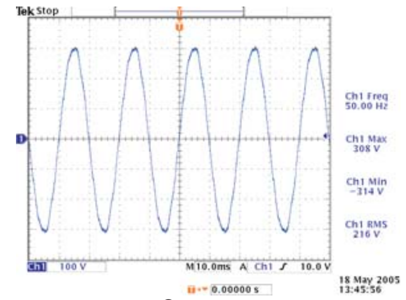
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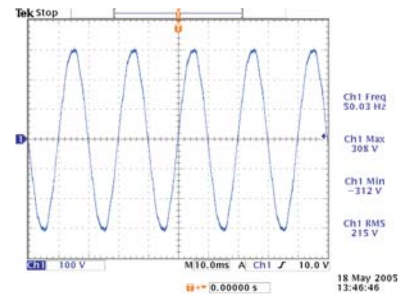
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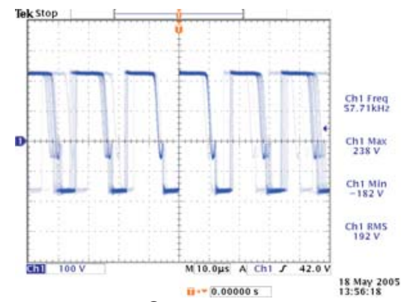
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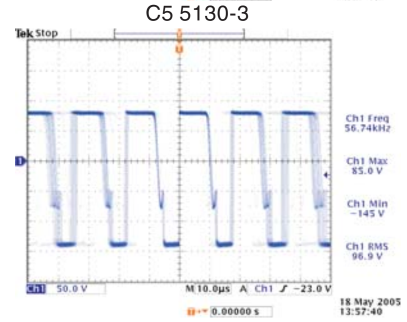
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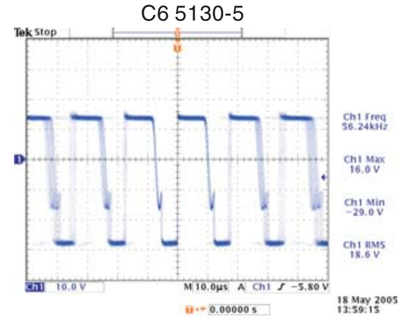
C4 5130-1



C5 5130-3



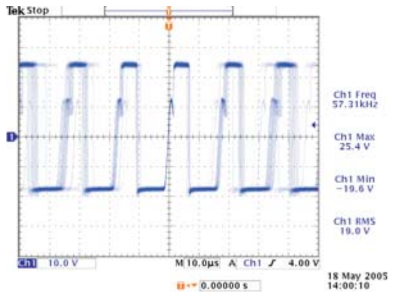
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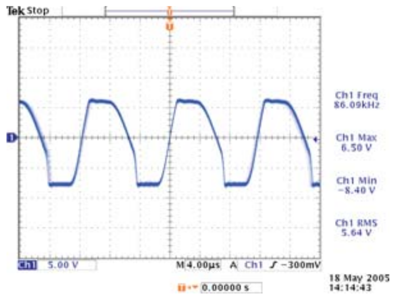
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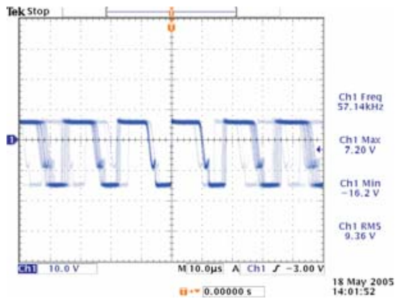
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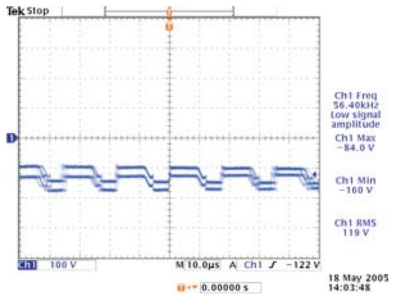
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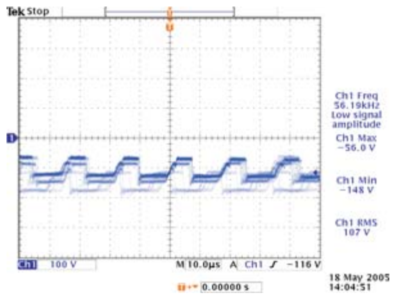
C8 5130-8



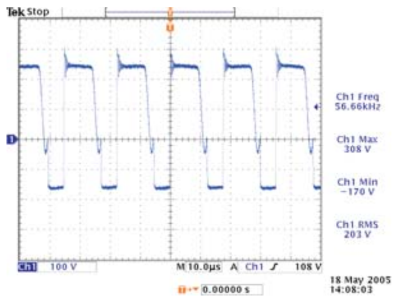
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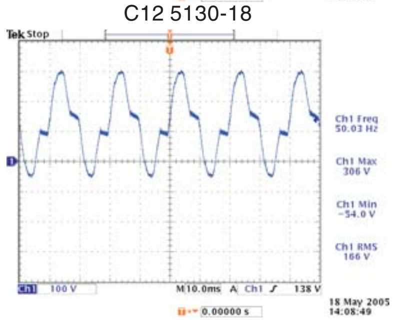
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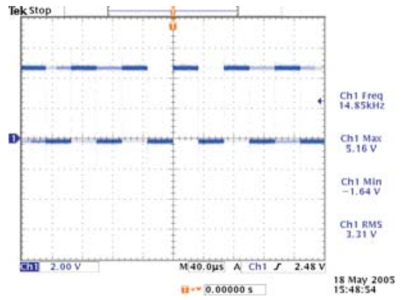
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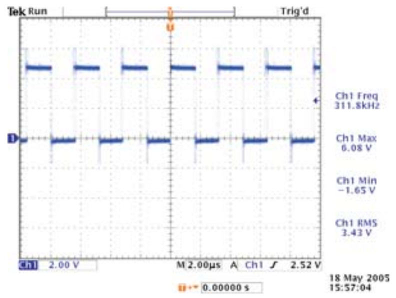
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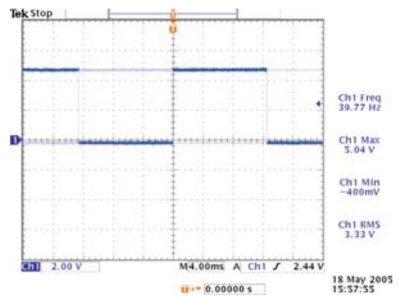
D1 7204-1



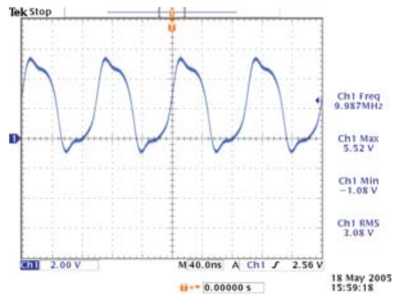
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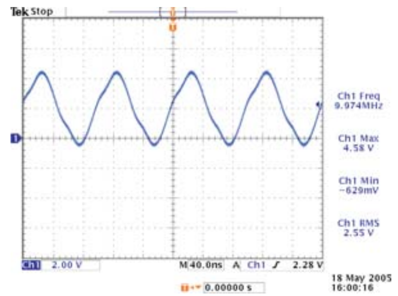
D3 7204-3



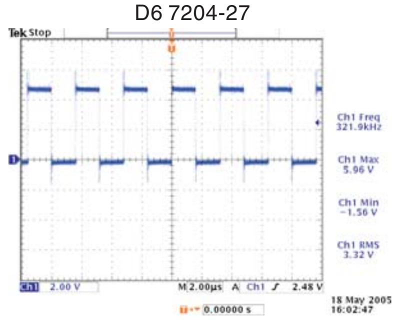
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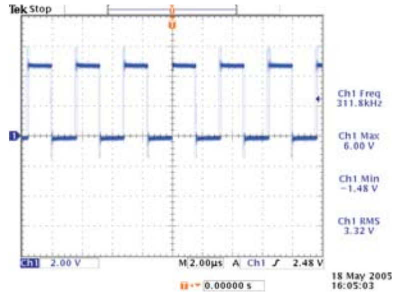
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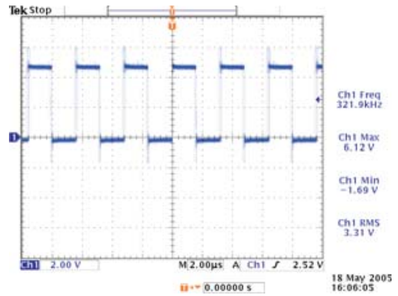
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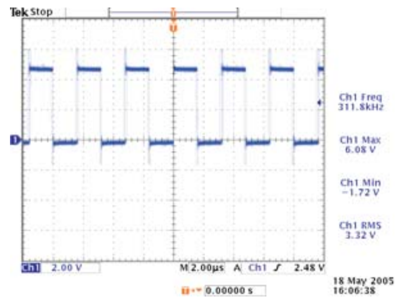
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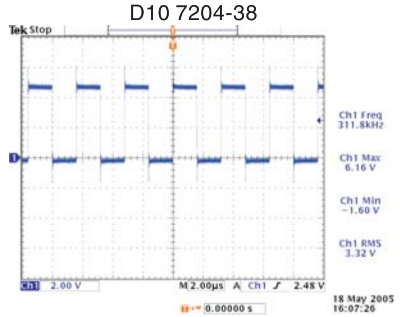
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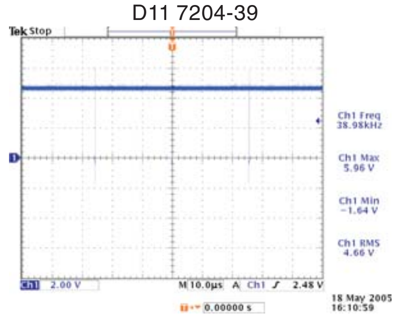
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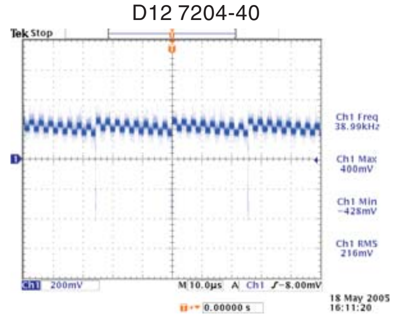
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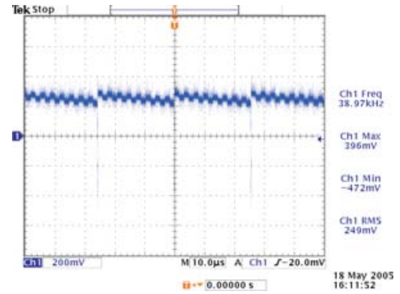
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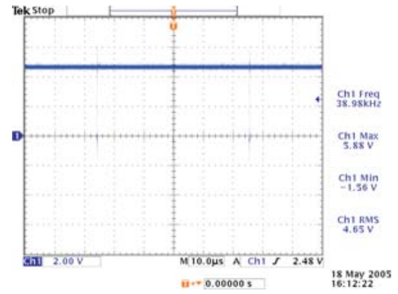


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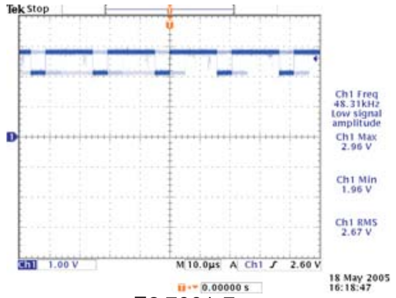
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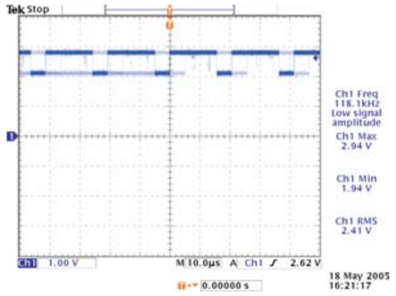


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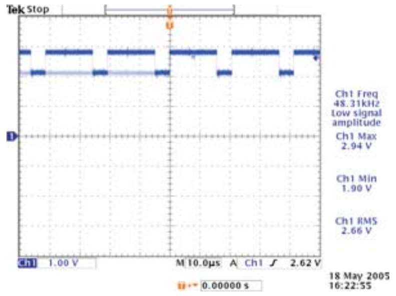
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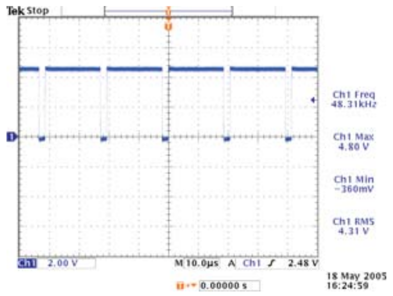
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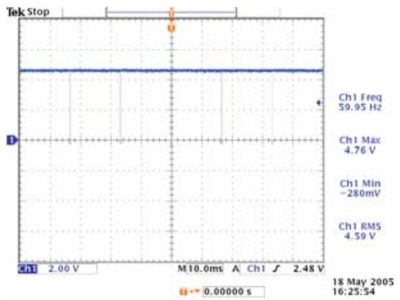
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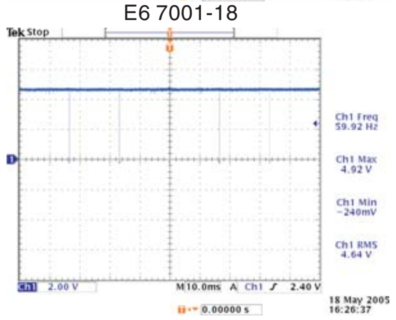
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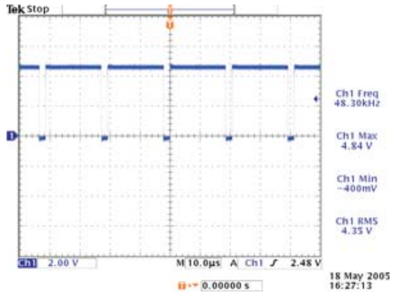
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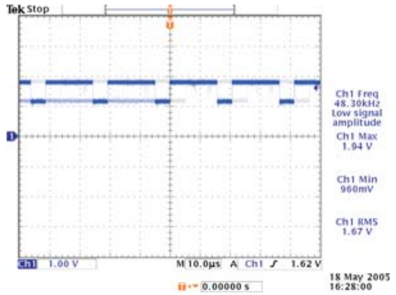
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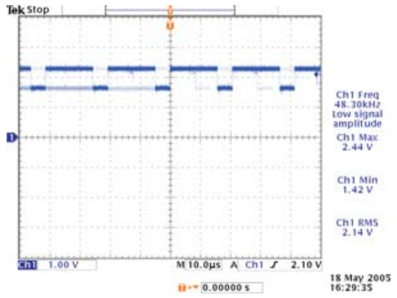
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E7 7001-19



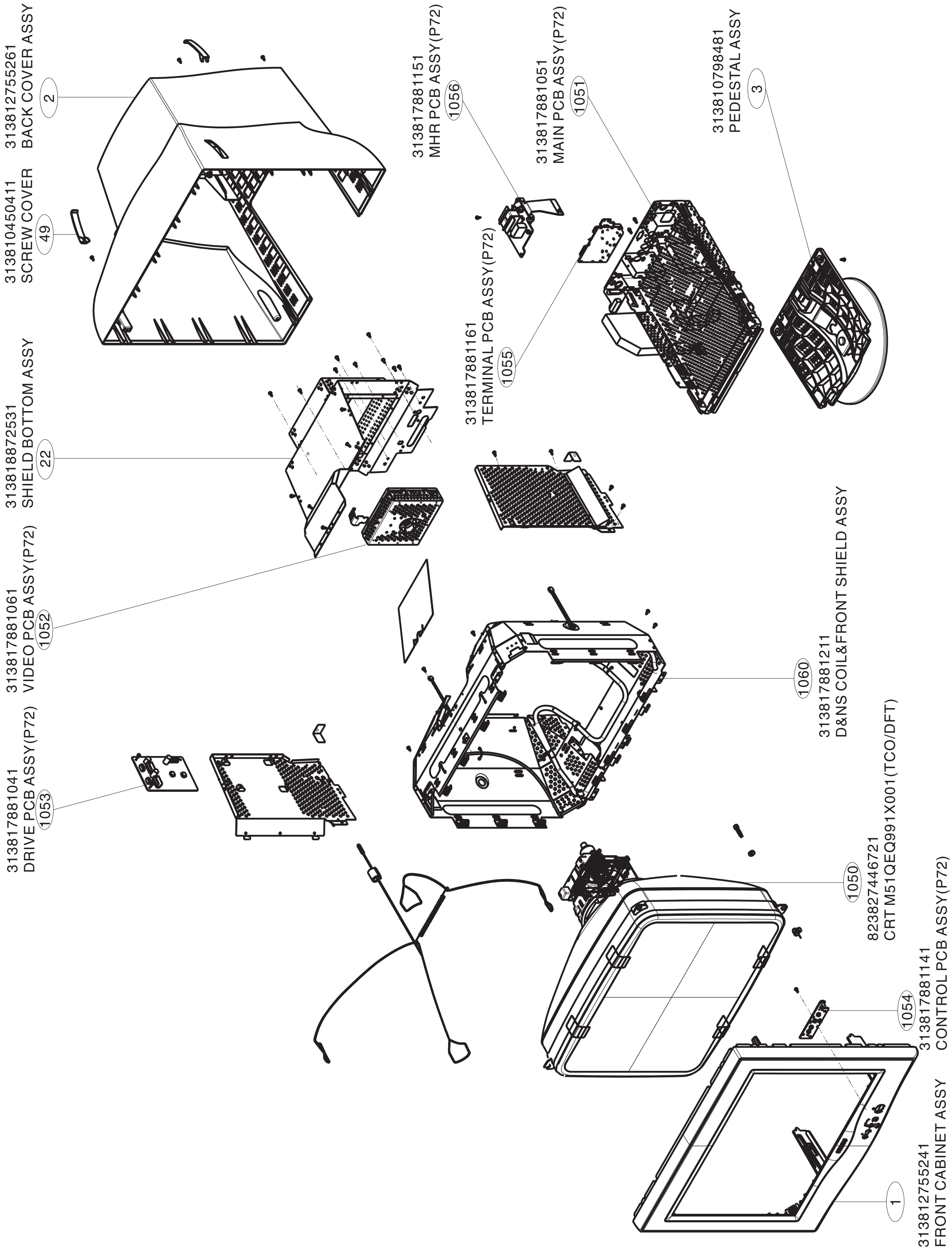
E8 7001-21



E9 7001-25

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Exploded View



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Spare Parts List

Model: 202P70/00 12NC: 8639 000 16171

Mechanical Parts

1	313812755241	FRONT CABINET ASSY
2	313812755261	BACK COVER ASSY
3	313810798481	PEDESTAL ASSY
22	313818872531	SHIELD BOTTOM ASSY
41	313810463051	FRONT CABINET
42	313810450403	BACK COVER
44	313810449471	BASE
46	313810463091	KNOB-OSD
47	313810463101	KNOB-POWER
48	313810450672	LENS-POWER
49	313810450411	SCREW COVER
51	313810463061	REAR COVER
53	313810449462	SWIVEL
56	313810449481	FOOT RUBBER
80	313810451961	NAME PLATE
1060	313817881211	D&NS COIL&FRONT SHIELD ASSY

Packing Parts

153	313810658051	P.E.BAG/ E-D.F.U.
450	313810663821	CARTON
451	313810657101	CUSHION - TOP FRONT
452	313810657112	CUSHION - TOP REAR
453	313810657121	CUSHION - BOTTOM
454	313810645301	PE BAG

Accessory

601	313811707744	E-D.F.U. ASSY
602	313811707754	E-D.F.U.
1057	313816874231	MAINS CORD
1058	313819870601	CORD SUB-D 15/1M8/15 D-SUB GY

miscellanea

178	313810541152	QUICK SETUP GUIDE-BOOKLET
213	313811581321	EEPROM-LABEL (SDI)
616	313811706001	HEX CODE OF F/W (NO MATL REQ)
1003	243803100164	CON H 6P M 2.50 RD 63854
1006	313817879621	CON BM H 10P M 2.5 625/626
1008	243803100417	SOC SUBD V 15P F 1226
1011	243812700019	SWI SLID 1P 3POS 30V V 8MM5
1061	313816876051	CBLE I25008 2/280 AWG 24
1062	242254900519	COI DEGAUS P72 62-0412 CU
1101	313817876762	AC INLET ASSY
1103	242208600208	FUSE 5X20 HT 4A 250V IEC
1131	313816876341	CON BM V 2P M 7.92 M241833
1190	243813200141	RELAY 2P 12V 5A OSA-SS
1191	242213207312	RELAY 2P 12V 5A VB12TBU5
1192	313816876341	CON BM V 2P M 7.92 M241833
1207	243854300061	RES XTL 12MHZ 30P HC49/U
1211	313817867521	MTP ASSY
1265	313817881171	EEPROM ASSY(P72)
1286	242203100256	SOC ANT H 5X1P F BNC 50 OHM
1301	243853500081	RES XTL 12MHZ 32P AT-49
1311	243803100066	CON V 7P M 2.50 625/635
1503	243803100116	CON V 3P M 2.50 63172
1891	242212803007	SWI TACT 1P 1POS 12V V 5MM
1892	242212803007	SWI TACT 1P 1POS 12V V 5MM
1893	242212803007	SWI TACT 1P 1POS 12V V 5MM
1894	242212803007	SWI TACT 1P 1POS 12V V 5MM
1895	242212803007	SWI TACT 1P 1POS 12V V 5MM
4444	313810610471	CD ROM - SERVICE MANUAL
4444	313810610472	SERVICE MANUAL
8001	313816873032	CBLE 330919 10P/430/11P 33099
8002	313816873011	CBLE 330941 11P/430/12P 33099
8003	313816875752	WIRE HARNES 10P+11P(41530)
8004	313816874791	CBLE 330938 9P/450/9P 33098
8101	313816878092	MHR 3P WIRE HAENESS
8103	313816878081	MHR 2P+2P WIRE HAENESS
8672	313816875071	CBLE FAST 115/2P FAST-RIN
8701	313819870361	CBLE H11002 6/215/6-915 AWG28
8702	313818873621	CBLE RING TERM/80/CLIP BRAID
8891	313818873592	CBLE330936 7/300/7 -856T AWG2

CRT Panel

1050	823827446721	CRT M51QEQ991X001(TCO/DFT)

PCB Assy

1051	313817881051	MAIN PCB ASSY(P72)
1052	313817881061	VIDEO PCB ASSY(P72)
1053	313817881041	DRIVE PCB ASSY(P72)
1054	313817881141	CONTROL PCB ASSY(P72)
1055	313817881161	TERMINAL PCB ASSY(P72)
1056	313817881151	MHR PCB ASSY(P72)

PCB Assy

1051	313817881051	MAIN PCB ASSY(P72)
2101	203831000007	CAP MPP 275V S 470N PM10
2102	203831000007	CAP MPP 275V S 470N PM10
2103	202203100088	ELCAP HP 400V S 330U PM20
2104	222236856333	CAP MPOL 400V S 33N PM5
2106	202055490139	CERSAF NSB 250V S 4N7 PM20
2108	202055490139	CERSAF NSB 250V S 4N7 PM20
2111	202203100092	ELCAP RGA 25V S 150U PM20
2115	223858015627	CER2 0805 X7R 50V 2N2 PM10
2120	203830200167	CAP MPOL 400V S 10N PM10
2122	223886115561	CER1 0805 NP0 50V 560P PM5
2123	223891015649	CER2 0805 X7R 25V 100N PM10
2124	225261808221	CER2 DC Y5P 500V S 2N2 PM10
2126	202055890556	CERHDT RR 1KV S 680P PM10
2127	222234741473	CAP POL 347 250V S 47N PM10
2128	223886115331	CER1 0805 NP0 50V 330P PM5
2129	202055490127	CERSAF NSA 250V S 2N2 PM20
2130	202055490149	CERSAF NSA 250V S 3N3 PM20
2131	202203100089	ELCAP RGA 350V S 100U PM20
2133	202203100075	ELCAP RXJ 100V S 220U PM20
2134	202203100225	ELCAP GL 25V S 2200U PM20
2135	202203100064	ELCAP RXJ 25V S 1000U PM20
2137	202203100064	ELCAP RXJ 25V S 1000U PM20
2139	202202000706	ELCAP GS 16V S 2200U PM20
2143	203803527203	ELCAP KM 16V S 220U PM20
2154	223886115101	CER1 0805 NP0 50V 100P PM5
2155	222291019856	CER2 0805 Y5V 25V 330N P8020
2160	202202000903	ELCAP SM 10V S 100U PM20
2162	202202000836	ELCAP GS 50V S 1U PM20
2163	202202000939	ELCAP REA 25V S 470U PM20
2171	223858015645	CER2 0805 X7R 50V 47N PM10
2172	222236585103	CAP MPOL 100V S 10N PM10
2173	203803527501	ELCAP KM 50V S 10U PM20
2174	202231100026	CAP MPOL 100V S 100N PM10
2301	203801750222	ELCAP REA 50V S 2U2 PM20
2302	203801750222	ELCAP REA 50V S 2U2 PM20
2303	203830250212	CAP MPOL 100V S 100N PM5
2304	202202000906	ELCAP SM 16V S 47U PM20
2305	202202000909	ELCAP SM 16V S 470U PM20
2306	203801750224	ELCAP REA 50V S 10U PM20
2307	223886115229	CER1 0805 NP0 50V 22P PM5
2308	203801750222	ELCAP REA 50V S 2U2 PM20
2309	203801750222	ELCAP REA 50V S 2U2 PM20
2310	203830250094	CAP MPOL 100V S 47N PM10
2311	203830250094	CAP MPOL 100V S 47N PM10
2312	225250508205	CER1 DC NP0 50V S 22P PM5
2313	225250508205	CER1 DC NP0 50V S 22P PM5
2314	223886115229	CER1 0805 NP0 50V 22P PM5
2315	223858015636	CER2 0805 X7R 50V 10N PM10
2316	203830250094	CAP MPOL 100V S 47N PM10
2336	202231100026	CAP MPOL 100V S 100N PM10
2337	223886115229	CER1 0805 NP0 50V 22P PM5
2338	223886115229	CER1 0805 NP0 50V 22P PM5
2361	203803527204	ELCAP KM 16V S 330U PM20
2362	203803513201	ELCAP RGA 16V S 100U PM20
2391	223891015649	CER2 0805 X7R 25V 100N PM10
2392	223886115101	CER1 0805 NP0 50V 100P PM5
2401	202231100026	CAP MPOL 100V S 100N PM10
2421	202231100026	CAP MPOL 100V S 100N PM10
2422	203830250121	CAP MPOL 100V S 150N PM10
2423	202055290607	CER1 DC NP0 50V S 220P PM5
2424	223891015649	CER2 0805 X7R 25V 100N PM10
2425	202203100094	ELCAP RGA 16V S 1500U PM20
2426	225250508205	CER1 DC NP0 50V S 22P PM5
2431	203830250212	CAP MPOL 100V S 100N PM5
2432	203830150186	CAP PP PPN 100V S 8N2 PM5
2433	203830250218	CAP MPOL 100V S 10N PM2
2434	203830150147	CAP PP PPN 100V S 1N8 PM5
2435	203830150186	CAP PP PPN 100V S 8N2 PM5
2441	203830150191	CAP PP PPN 100V S 3N3 PM2
2442	223858015629	CER2 0805 X7R 50V 3N3 PM10
2443	223858015645	CER2 0805 X7R 50V 47N PM10
2445	202202000906	ELCAP SM 16V S 47U PM20
2446	222236525474	CAP MPOL 100V S 470N PM10
2456	202202000906	ELCAP SM 16V S 47U PM20
2461	203830100104	CAP PP PPN 250V S 220N PM5
2462	223886115221	CER1 0805 NP0 50V 220P PM5
2463	202202000906	ELCAP SM 16V S 47U PM20
2464	223858015633	CER2 0805 X7R 50V 5N6PM10 R
2491	202231100026	CAP MPOL 100V S 100N PM10
2501	202233300303	CAP MPP 250V S 470NPM5 B
2502	203803522801	ELCAP BP NK 160V S 1U PM20
2503	202231100026	CAP MPOL 100V S 100N PM10
2504	222237590705	CAP PP-MPP 2K5V S 3N3 PM5
2506	225271214216	CERHDT F-Y5R 2KV S 220P PM10
2507	225271214216	CERHDT F-Y5R 2KV S 220P PM10
2516	222236525474	CAP MPOL 100V S 470N PM10
2518	202231100026	CAP MPOL 100V S 100N PM10
2519	202231100026	CAP MPOL 100V S 100N PM10
2520	202231100026	CAP MPOL 100V S 100N PM10
2541	203803522801	ELCAP BP NK 160V S 1U PM20
2542	203830100117	CAP MPP 100V S 1U PM10
2543	202203100089	ELCAP RGA 350V S 100U PM20
2544	225271214316	CERHDT F-Y5R 2KV S 330P PM10
2545	223891015649	CER2 0805 X7R 25V 100N PM10
2546	223891015649	CER2 0805 X7R 25V 100N PM10
2551	203803513301	ELCAP RGA 25V S 47U PM20
2552	203803513301	ELCAP RGA 25V S 47U PM20
2553	203830100201	CAP PP PPN 400V S 82N PM5
2554	203830100201	CAP PP PPN 400V S 82N PM5
2555	202231100026	CAP MPOL 100V S 100N PM10
2556	223891015649	CER2 0805 X7R 25V 100N PM10
2566	203803527501	ELCAP KM 50V S 10U PM20
2567	202203100221	ELCAP KM 25V S 470U PM20
2568	203803511402	ELCAP REA 35V S 100U PM20
2569	202055290607	CER1 DC NP0 50V S 220P PM5
2576	202231800224	CAP MPOL 100V S 22N PM10
2577	202203100221	ELCAP KM 25V S 470U PM20
2578	202231100026	CAP MPOL 100V S 100N PM10
2579	222236525474	CAP MPOL 100V S 470N PM10
2586	203830250212	CAP MPOL 100V S 100N PM5
2588	202231100026	CAP MPOL 100V S 100N PM10
2589	202231100026	CAP MPOL 100V S 100N PM10
2601	225256214406	CER1 DC SL 2KV S 47P PM10
2602	202055890662	CER1 DC SL 2KV S 56P PM5
2603	202055890555	CERHDT RR 1KV S 470P PM10
2604	225271214116	CERHDT F-Y5R 2KV S 150P PM10
2605	225271214116	CERHDT F-Y5R 2KV S 150P PM10
2608	202055800006	CER2 DC E 2KV S 10N P8020
2613	203803513301	ELCAP RGA 25V S 47U PM20
2620	202233300302	CAP PP PPN 400V S 27N PM5
2621	203830100408	CAP PP PPN 400V S 56N PM5
2623	203830100104	CAP PP PPN 250V S 220N PM5
2624	203830100303	CAP MPP MPS 250V S 470N PM5
2625	203830100333	CAP MPP MPS 250V S 910N PM5
2626	203830100158	CAP MPP MPS 250V S 1U8 PM5
2628	223891015649	CER2 0805 X7R 25V 100N PM10
2632	203830100411	CAP PP PPN 250V S 120N PM5
2651	202202000836	ELCAP GS 50V S 1U PM20
2652	223858015625	CER2 0805 X7R 50V 1N5 PM10
2653	223858015629	CER2 0805 X7R 50V 3N3 PM10
2655	203830150151	CAP PP PPN 100V S 10N PM2
2656	203803527305	ELCAP KM 25V S 220U PM20
2657	223858015624	CER2 0805 X7R 50V 1N2 PM10
2658	222278019867	CER2 0805 Y5V 16V 2U2 P8020
2659	203801750285	ELCAP REA 25V S 47U PM20
2660	223878019858	CER2 0805 Y5V 16V 470N P8020
2661	223878019858	CER2 0805 Y5V 16V 470N P8020
2662	223886115101	CER1 0805 NP0 50V 100P PM5
2663	222278019867	CER2 0805 Y5V 16V 2U2 P8020
2671	202203100298	ELCAP PF 250V S 33U PM20

2672	223891015649	CER2 0805 X7R 25V 100N PM10
2673	225271214316	CERHDT F-Y5R 2KV S 330P PM10
2681	223858015627	CER2 0805 X7R 50V 2N2 PM10
2682	202203100087	ELCAP KL 350V S 100U PM20
2683	203830100174	CAP PP PPN 630V S 4N7 PM5
2684	222234741473	CAP POL 347 250V S 47N PM10
2685	202202000906	ELCAP SM 16V S 47U PM20
2686	225271108026	CERHDT F-Y5R 1KV S 1N PM10
2691	222234741473	CAP POL 347 250V S 47N PM10
2693	203830200226	CAP MPOL 100V S 1U8 PM5
2694	203830250212	CAP MPOL 100V S 100N PM5
3102	232224213684	RST MGL VR37 A 680K PM5
3103	213866000024	NTC DC SCK-058 S 5R PM15
3104	213810500337	RST MOX 1W RSS A 100K PM5
3105	213810500337	RST MOX 1W RSS A 100K PM5
3106	212011300017	RST MGL RMU12 A 220K PM5
3107	213811201124	RST SM 0805 RC05 120K PM5
3109	213811201101	RST SM 0805 RC05 100R PM5
3110	232224181005	RST MGL VR25 A 1M PM1
3112	212010590767	RST MOX 1W RSS A 68R PM5
3113	232224181005	RST MGL VR25 A 1M PM1
3115	212211000366	RST MFLM MF1/2WS A 2K4 PM1
3121	212210102191	RST CRB CF1/6 A 1K5 PM5A
3123	212212400001	RST MPLT 5W MPR S 0R12 PM10
3125	213810113102	RST CRB CFR-12 A 1K PM5
3128	213866000037	PTC DBL-MON0 270V 4R5 P3020
3150	213810113102	RST CRB CFR-12 A 1K PM5
3151	231291518203	RST MFLM MBB0207 A 82K PM1
3152	213810113102	RST CRB CFR-12 A 1K PM5
3153	212020200015	RST FUSE RFU1/3 A 1R PM5
3154	213810500433	RST MGL RMU14 A 470K PM1
3155	232273061334	RST SM 0805 RC11 330K PM5
3156	232273464702	RST SM 0805 RC12H 4K7 PM1
3157	213836500081	RTRM CER LIN 1K H VG067TL1
3158	232273061479	RST SM 0805 RC11 47R PM5
3159	232273061182	RST SM 0805 RC11 1K8 PM5
3160	212211600311	RST MFLM MF0207 A 47R PM1
3161	212210102205	RST CRB CF1/6 A 22K PM5
3162	212210102201	RST CRB CF1/6 A 10K PM5
3163	213811201339	RST SM 0805 RC05 33R PM5
3164	212210102181	RST CRB CF1/6 A 100R PM5
3165	232273061271	RST SM 0805 RC11 270R PM5
3170	232220733109	RST FUSE NFR25H A 10R PM5
3174	212210101509	RST CRB CF1/6 A 1M5 PM5
3175	212211000358	RST MFLM MF1/2WS A 1K2 PM1
3176	213811201243	RST SM 0805 RC05 24K PM5
3177	232273061153	RST SM 0805 RC11 15K PM5
3179	213811201822	RST SM 0805 RC05 8K2 PM5
3301	212210102205	RST CRB CF1/6 A 22K PM5
3302	213811201472	RST SM 0805 RC05 4K7 PM5
3303	213811201472	RST SM 0805 RC05 4K7 PM5
3304	213811201472	RST SM 0805 RC05 4K7 PM5
3305	212210102205	RST CRB CF1/6 A 22K PM5
3306	212210102214	RST CRB CF1/6 A 100K PM5
3307	213810113102	RST CRB CFR-12 A 1K PM5
3310	213811201103	RST SM 0805 RC05 10K PM5
3311	213811201103	RST SM 0805 RC05 10K PM5
3312	213811201103	RST SM 0805 RC05 10K PM5
3313	213811201103	RST SM 0805 RC05 10K PM5
3314	213811201103	RST SM 0805 RC05 10K PM5
3315	213811201103	RST SM 0805 RC05 10K PM5
3316	212210102197	RST CRB CF1/6 A 4K7 PM5
3317	212210102181	RST CRB CF1/6 A 100R PM5
3318	213811201103	RST SM 0805 RC05 10K PM5
3319	213811203006	RST NETW RNL 5X 4K7 PM5
3326	212210102197	RST CRB CF1/6 A 4K7 PM5
3327	232273061153	RST SM 0805 RC11 15K PM5
3328	212211000341	RST MFLM MF1/2WS A 270R PM1
3329	212211000317	RST MFLM MF1/2WS A 15R PM1
3330	212210102201	RST CRB CF1/6 A 10K PM5
3331	212210102197	RST CRB CF1/6 A 4K7 PM5
3332	212210102181	RST CRB CF1/6 A 100R PM5
3333	213811201103	RST SM 0805 RC05 10K PM5
3335	212210102181	RST CRB CF1/6 A 100R PM5
3337	213810113222	RST CRB CFR-12 A 2K2 PM5
3338	213810113222	RST CRB CFR-12 A 2K2 PM5
3340	212210102181	RST CRB CF1/6 A 100R PM5
3341	212210102201	RST CRB CF1/6 A 10K PM5
3342	212211600369	RST MFLM MF0207 A 33K PM1
3343	212210102181	RST CRB CF1/6 A 100R PM5
3344	212210102181	RST CRB CF1/6 A 100R PM5
3345	212210102181	RST CRB CF1/6 A 100R PM5
3347	213811201472	RST SM 0805 RC05 4K7 PM5
3348	212210102205	RST CRB CF1/6 A 22K PM5
3349	212210102205	RST CRB CF1/6 A 22K PM5
3350	212210102205	RST CRB CF1/6 A 22K PM5
3393	213811201472	RST SM 0805 RC05 4K7 PM5
3394	213811201103	RST SM 0805 RC05 10K PM5
3395	213811201472	RST SM 0805 RC05 4K7 PM5
3396	213811201103	RST SM 0805 RC05 10K PM5
3397	212210102197	RST CRB CF1/6 A 4K7 PM5
3398	212210102181	RST CRB CF1/6 A 100R PM5
3403	213811291002	RST SM 0805 JUMP. MAX 0R05
3404	213810113471	RST CRB CFR-12 A 470R PM5
3421	212211000392	RST MFLM MF1/2WS A 22K PM1
3422	213810113471	RST CRB CFR-12 A 470R PM5
3423	213811201472	RST SM 0805 RC05 4K7 PM5
3424	212210102181	RST CRB CF1/6 A 100R PM5
3425	213811201103	RST SM 0805 RC05 10K PM5
3426	212210102181	RST CRB CF1/6 A 100R PM5
3427	212210102181	RST CRB CF1/6 A 100R PM5
3428	213810113225	RST CRB CFR-12 A 2M2 PM5
3429	213811201155	RST SM 0805 RC05 1M5 PM5
3430	213811201101	RST SM 0805 RC05 100R PM5
3431	232273061182	RST SM 0805 RC11 1K8 PM5
3432	231291514641	RST MFLM MBB0207 A 464R PM1
3433	212211000446	RST MFLM MF1/2WS A 2K67 PM1
3434	213811201472	RST SM 0805 RC05 4K7 PM5
3441	231291515603	RST MFLM MBB0207 A 56K PM1
3442	232224182204	RST MGL VR25 A 220K PM1
3443	212210102212	RST CRB CF1/6 A 68K PM5
3444	213811291002	RST SM 0805 JUMP. MAX 0R05
3446	213811201123	RST SM 0805 RC05 12K PM5
3450	230620403828	RST FUSE NFR25 S 8R2 PM5
3451	213811201122	RST SM 0805 RC05 1K2 PM5
3456	230620403828	RST FUSE NFR25 S 8R2 PM5
3457	213811201122	RST SM 0805 RC05 1K2 PM5
3458	212210102201	RST CRB CF1/6 A 10K PM5
3462	212210102201	RST CRB CF1/6 A 10K PM5
3464	232273061153	RST SM 0805 RC11 15K PM5
3465	212210102201	RST CRB CF1/6 A 10K PM5
3466	212210102201	RST CRB CF1/6 A 10K PM5
3467	213811201472	RST SM 0805 RC05 4K7 PM5
3468	212210102197	RST CRB CF1/6 A 4K7 PM5
3469	212210101479	RST CRB CF1/4 A 47K PM5
3470	213810113221	RST CRB CFR-12 A 220R PM5
3471	213810113473	RST CRB CFR-12 A 47K PM5
3472	231291515603	RST MFLM MBB0207 A 56K PM1
3473	231291511003	RST MFLM MBB0207 A 10K PM1
3474	212211600386	RST MFLM MF0207 A 150K PM1
3475	212210101469	RST CRB CF1/4 A 10K PM5
3476	232224181005	RST MGL VR25 A 1M PM1
3491	232273061473	RST SM 0805 RC11 47K PM5
3492	232273061473	RST SM 0805 RC11 47K PM5
3494	213811201101	RST SM 0805 RC05 100R PM5
3495	212210102181	RST CRB CF1/6 A 100R PM5
3501	213810500335	RST MOX5W RSM5WL S 680R PM5
3502	213810500442	RST MOX5W RSM5WL S 5K6 PM5
3503	212210102178	RST CRB CF1/6 A 47R PM5
3504	212210102201	RST CRB CF1/6 A 10K PM5
3505	213810500335	RST MOX5W RSM5WL S 680R PM5
3506	213810500404	RST MOX 7W RSH S 1R5 PM5
3507	231291516809	RST MFLM MBB0207 A 68R PM1
3508	213811273221	RST CRB CFR-25 A 220R PM5
3515	213810500074	RST MOX5W RSM5WL S 150R PM5
3517	213810113471	RST CRB CFR-12 A 470R PM5
3518	213810113471	RST CRB CFR-12 A 470R PM5
3519	231291516809	RST MFLM MBB0207 A 68R PM1
3521	231291516809	RST MFLM MBB0207 A 68R PM1
3522	231291514708	RST MFLM MBB0207 A 4R7 PM1
3523	230620403159	RST FUSE NFR25 S 15R PM5
3524	230620403159	RST FUSE NFR25 S 15R PM5
3525	212210101448	RST CRB CF1/4 A 470R PM5
3527	213811201103	RST SM 0805 RC05 10K PM5
3528	212210102181	RST CRB CF1/6 A 100R PM5
3529	212210102201	RST CRB CF1/6 A 10K PM5
3530	232273061182	RST SM 0805 RC11 1K8 PM5
3531	213811273122	RST CRB CFR-25 A 1K2 PM5
3541	212210102175	RST CRB CF1/6 A 10R PM5
3542	212211600321	RST MFLM MF0207 A 200R PM1
3544	231291511009	RST MFLM MBB0207 A 10R PM1
3545	213810500095	RST MOX 7W RSH S 33R PM5
3546	212210102178	RST CRB CF1/6 A 47R PM5
3551	230620403108	RST FUSE NFR25 S 1R PM5
3552	230620403108	RST FUSE NFR25 S 1R PM5
3553	231291515602	RST MFLM MBB0207 A 5K6 PM1
3554	231291511203	RST MFLM MBB0207 A 12K PM1
3555	213811201103	RST SM 0805 RC05 10K PM5
3556	213811201202	RST SM 0805 RC05 2K PM5
3566	212210102197	RST CRB CF1/6 A 4K7 PM5
3569	212020200057	RST FUSE RFS1/2 A 0R12 PM5
3570	212211600343	RST MFLM MF0207 A 2K2 PM1
3571	212210101448	RST CRB CF1/4 A 470R PM5
3572	212210101448	RST CRB CF1/4 A 470R PM5
3576	212211600343	RST MFLM MF0207 A 2K2 PM1
3577	212020200001	RST FUSE RFS1/2 A 1R PM5
3578	212211600311	RST MFLM MF0207 A 47R PM1
3579	231291511508	RST MFLM MBB0207 A 1R5 PM1
3580	212211600294	RST MFLM MF0207 A 2R2 PM1
3581	231291512201	RST MFLM MBB0207 A 220R PM1
3582	231291511508	RST MFLM MBB0207 A 1R5 PM1
3585	212210102207	RST CRB CF1/6 A 33K PM5
3586	213810113433	RST CRB CFR-12 A 43K PM5
3587	212210102213	RST CRB CF1/6 A 82K PM5
3589	212210102207	RST CRB CF1/6 A 33K PM5
3590	212020200035	RST FUSE RFU1/3 A 43R PM5
3591	212020200035	RST FUSE RFU1/3 A 43R PM5
3592	212211600328	RST MFLM MF0207 A 470R PM1
3593	212211000466	RST MFLM MF1/2WS A 30R PM1
3594	213866000029	NTC DC TTC-301 S 300R PM5
3601	212011300017	RST MGL RMU12 A 220K PM5
3602	212010592168	RST MOX 2W RSS S 10K PM5
3604	212211600369	RST MFLM MF0207 A 33K PM1
3605	232224213104	RST MGL VR37 A 100K PM5
3606	232224213105	RST MGL VR37 A 1M PM5
3607	232224213105	RST MGL VR37 A 1M PM5
3608	231291511002	RST MFLM MBB0207 A 1K PM1
3609	232224522152	RST MGL LSR37 A 1K5 PM10
3612	212210102213	RST CRB CF1/6 A 82K PM5
3615	212211600316	RST MFLM MF0207 A 100R PM1
3616	232224213475	RST MGL VR37 A 4M7 PM5
3617	212010128222	RST CMP ERC12 A 2K2 PM10
3618	213811201154	RST SM 0805 RC05 150K PM5
3620	213811201104	RST SM 0805 RC05 100K PM5
3621	212210102201	RST CRB CF1/6 A 10K PM5
3622	213811201104	RST SM 0805 RC05 100K PM5
3623	212210102201	RST CRB CF1/6 A 10K PM5
3624	213811201104	RST SM 0805 RC05 100K PM5
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3627	212210102201	RST CRB CF1/6 A 10K PM5
3628	213811201104	RST SM 0805 RC05 100K PM5
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3630	213811201104	RST SM 0805 RC05 100K PM5
3631	212210102207	RST CRB CF1/6 A 33K PM5
3632	213811201104	RST SM 0805 RC05 100K PM5
3633	212210102207	RST CRB CF1/6 A 33K PM5
3634	212210101458	RST CRB CF1/4 A 2K2 PM5
3635	212010592165	RST MOX 2W RSS S 4K7 PM5
3653	212210101426	RST CRB CF1/4 A 12R PM5
3656	213811201472	RST SM 0805 RC05 4K7 PM5
3658	212210102195	RST CRB CF1/6 A 3K3 PM5
3659	231291515602	RST MFLM MBB0207 A 5K6 PM1
3660	232273061562	RST SM 0805 RC11 5K6 PM5
3661	232273061479	RST SM 0805 RC11 47R PM5
3662	213811201472	RST SM 0805 RC05 4K7 PM5
3663	232273464702	RST SM 0805 RC12H 4K7 PM1
3664	213811201332	RST SM 0805 RC05 3K3 PM5
3665	213811201103	RST SM 0805 RC05 10K PM5
3666	213811201105	RST SM 0805 RC05 1M PM5
3667	213811201472	RST SM 0805 RC05 4K7 PM5
3668	232273061223	RST SM 0805 RC11 22K PM5
3671	232224181005	RST MGL VR25 A 1M PM1

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3672	212020200017	RST FUSE RFU1/3 A 4R7 PM5
3673	213811201105	RST SM 0805 RC05 1M PM5
3674	231291511002	RST MFLM MBB0207 A 1K PM1
3675	231291511009	RST MFLM MBB0207 A 10R PM1
3676	231291511003	RST MFLM MBB0207 A 10K PM1
3677	212010592444	RST MOX 2W RSS S 68R PM5
3678	213811273101	RST CRB CFR-25 A 100R PM5
3679	212210101448	RST CRB CF1/4 A 470R PM5
3680	212210101469	RST CRB CF1/4 A 10K PM5
3681	231291511009	RST MFLM MBB0207 A 10R PM1
3682	232224213104	RST MGL VR37 A 100K PM5
3683	212010128102	RST CMP ERC12 A 1K PM10
3684	212211600351	RST MFLM MF0207 A 4K7 PM1
3685	212210101469	RST CRB CF1/4 A 10K PM5
3686	232273061272	RST SM 0805 RC11 2K7 PM5
3687	213811201103	RST SM 0805 RC05 10K PM5
3688	213811201393	RST SM 0805 RC05 39K PM5
3689	213810113153	RST CRB CFR-12 A 15K PM5
3690	213810113102	RST CRB CFR-12 A 1K PM5
3691	232224522152	RST MGL LSR37 A 1K5 PM10
3692	232224213684	RST MGL VR37 A 680K PM5
3693	231291511004	RST MFLM MBB0207 A 100K PM1
3694	212211600378	RST MFLM MF0207 A 75K PM1
3695	213836500102	RTRM CER LIN 20K H VG067TL1
3696	231291511005	RST MFLM MBB0207 A 1M PM1
3697	231291516803	RST MFLM MBB0207 A 68K PM1
3698	213836500102	RTRM CER LIN 20K H VG067TL1
3699	232273061102	RST SM 0805 RC11 1K PM5
5101	313816873611	LINE FILTER (HJC-K8259)
5130	313818873531	TFM SMTLAYER SRW42ES-T71V119
5131	313818873551	TFM SMT LAYER SRW19LES-T14V11
5132	242253600036	IND FXD TSL0808 S 100U PM10
5301	313817875961	CHOKE 33MUH
5501	313819870561	TFM SIG DRIVER LS-PH03D-001
5502	313816874061	BEAD BF30UTA-3.5X5X1B
5503	242254900502	COI LINCOR 10UH3 HL2455H
5504	242254900501	COI LINCOR 10UH6 HL2455H
5505	313816874061	BEAD BF30UTA-3.5X5X1B
5540	313816874061	BEAD BF30UTA-3.5X5X1B
5541	313819870571	TFM SIG DRIVER LS-PH03F-004
5542	242253600036	IND FXD TSL0808 S 100U PM10
5543	313816873421	CENTER TRANSFORMER-SRW33IS-T2
5544	313816873531	CHOCK COIL(SRW25EF-T01V001)
5545	313816873521	CHOCK COIL(SRW16UW-T09H001)
5601	313816876601	DAF TRANSFORMER HJC-K8249
5670	242253597069	IND FXD SP0305 A 4U7 PM10
5671	242253100092	TFM LOT LAYER CF2145A
5672	242253600036	IND FXD TSL0808 S 100U PM10
6101	931900263671	BRIDGE GBU6J-E3 (VISH)
6104	932221086673	DIO REC BYV26EGP A (GULF)
6109	933117810133	DIO REG BZX79-C12 A (PHSE)
6114	933952580685	DIO SIG SM BAV103 (VISH)
6115	933952580685	DIO SIG SM BAV103 (VISH)
6116	933952580685	DIO SIG SM BAV103 (VISH)
6117	933913910115	DIO SIG SM BAS32L (PHSE)
6124	933497950673	DIO REC RGP10J-E3 A (VISH)
6125	933913910115	DIO SIG SM BAS32L (PHSE)
6131	932220010682	DIO REC 31GF6L-5302 (VISH)
6133	932220010682	DIO REC 31GF6L-5302 (VISH)
6134	932208187683	DIO REC BYW98-200 (ST00)
6135	932208187683	DIO REC BYW98-200 (ST00)
6137	932208187683	DIO REC BYW98-200 (ST00)
6139	932210346673	DIO REC SBYV27-200-E3 (VISH)
6143	933751660673	DIO REC RGP10D-E3 A (VISH)
6145	933083990133	DIO SIG 1N4148 A (PHSE)
6147	933957760673	DIO REC SB140-E3 A (VISH)
6148	933712890673	DIO REG BZX55-C7V5 A (VISH)
6149	933083990133	DIO SIG 1N4148 A (PHSE)
6150	933712880673	DIO REG BZX55-C5V1 A (VISH)
6152	933913910115	DIO SIG SM BAS32L (PHSE)
6153	934003630115	DIO SIG SM BAS32L (PHSE)
6160	933913910115	DIO SIG SM BAS32L (PHSE)
6172	933117960133	DIO REG BZX79-C51 A (PHSE)
6174	933416590673	DIO REG BZX55-C5V6 A (VISH)
6176	933913910115	DIO SIG SM BAS32L (PHSE)
6177	933952580685	DIO SIG SM BAV103 (VISH)
6303	932209863685	DIO SIG SM BAV99 (VISH)
6304	932209863685	DIO SIG SM BAV99 (VISH)
6391	932209863685	DIO SIG SM BAV99 (VISH)
6392	932209863685	DIO SIG SM BAV99 (VISH)
6422	933957760673	DIO REC SB140-E3 A (VISH)
6423	933913910115	DIO SIG SM BAS32L (PHSE)
6424	933083990133	DIO SIG 1N4148 A (PHSE)
6426	933083990133	DIO SIG 1N4148 A (PHSE)
6462	933713010673	DIO REG BZX55-C30 A (VISH)
6463	933913910115	DIO SIG SM BAS32L (PHSE)
6464	933712880673	DIO REG BZX55-C5V1 A (VISH)
6501	932213642673	DIO REC BYT42G A (VISH)
6502	933751660673	DIO REC RGP10D-E3 A (VISH)
6503	933083990133	DIO SIG 1N4148 A (PHSE)
6506	932210346673	DIO REC SBYV27-200-E3 (VISH)
6507	933117850133	DIO REG BZX79-C18 A (PHSE)
6515	932221086673	DIO REC BYV26EGP A (GULF)
6518	932218230687	DIO REC 5VUZ52 (TSOJ)
6540	933497950673	DIO REC RGP10J-E3 A (VISH)
6542	933083990133	DIO SIG 1N4148 A (PHSE)
6543	932220011682	DIO REC 31GF4L-5302 (VISH)
6544	933751660673	DIO REC RGP10D-E3 A (VISH)
6545	933751660673	DIO REC RGP10D-E3 A (VISH)
6566	933083990133	DIO SIG 1N4148 A (PHSE)
6567	933504400673	DIO REC RGP15G-E3 A (VISH)
6601	933724630113	DIO REC BY614 A (PHSE)
6603	933724630113	DIO REC BY614 A (PHSE)
6621	933083990133	DIO SIG 1N4148 A (PHSE)
6622	933712880673	DIO REG BZX55-C5V1 A (VISH)
6651	933751660673	DIO REC RGP10D-E3 A (VISH)
6652	933712880673	DIO REG BZX55-C5V1 A (VISH)
6653	933913910115	DIO SIG SM BAS32L (PHSE)
6654	933913910115	DIO SIG SM BAS32L (PHSE)
6655	933712880673	DIO REG BZX55-C5V1 A (VISH)
6656	933913910115	DIO SIG SM BAS32L (PHSE)
6671	933497950673	DIO REC RGP10J-E3 A (VISH)
6672	932221826682	DIO REC 31GF6L-5304-E3 (VISH)
6673	933751660673	DIO REC RGP10D-E3 A (VISH)
6674	933612320153	DIO REC BY584 A (PHSE)
7121	932214576682	IC STR-F6656(LF1352) (SAKJ)
7122	932217439685	TRA SIG SM BC857C (KEC0)
7130	932214014667	OPT CP TCET1103(G) (VISH)
7132	933567120126	TRA SIG BC516 (PHSE)
7133	932206519687	TRA POW BUX87 (ST00)
7134	933179600126	TRA SIG BC337-40 (PHSE)
7135	932214014667	OPT CP TCET1103(G) (VISH)
7143	932209200687	IC L4940V5 (ST00)
7144	933237790126	TRA SIG BC547C (PHSE)
7145	932217440685	TRA SIG SM KRC102S (KEC0)
7155	932208367676	IC TL431CZ S (ST00)
7161	933179600126	TRA SIG BC337-40 (PHSE)
7301	823827446731	CPU,IC 6160-K420PH-06A
7302	932217439685	TRA SIG SM BC857C (KEC0)
7303	933967310685	TRA SIG SM BC848CLG (ONSE)
7304	932217440685	TRA SIG SM KRC102S (KEC0)
7336	932214725682	IC M24C16-WBN6P (ST00)
7363	933504020682	IC L7812CV (ST00)
7364	932208834687	IC MC7808ACT (ONSE)
7391	932217440685	TRA SIG SM KRC102S (KEC0)
7392	932217439685	TRA SIG SM BC857C (KEC0)
7404	933282660652	IC HEF4053BP (PHSE)
7421	935273064112	IC TDA4856/V6 (PHSE)
7422	933179600126	TRA SIG BC337-40 (PHSE)
7423	933953410676	TRA SIG TBC328-40 (TOSJ)
7424	932217440685	TRA SIG SM KRC102S (KEC0)
7425	933237790126	TRA SIG BC547C (PHSE)
7426	932210142676	TRA SIG BC558C (KEC0)
7427	932217439685	TRA SIG SM BC857C (KEC0)
7461	932214470676	TRA SIG BC546 (KEC0)
7462	933237790126	TRA SIG BC547C (PHSE)
7463	932210142676	TRA SIG BC558C (KEC0)
7464	933878830676	TRA SIG BF423 (TOSJ)
7465	933705890676	TRA SIG BF422 (TOSJ)
7466	932217440685	TRA SIG SM KRC102S (KEC0)
7501	934000540115	FET POW SM BSP126 (PHSE)
7502	932217972682	TRA POW 2SC5570 (TOSJ)
7503	932205702687	TRA POW BD533 (ST00)
7504	932205703687	TRA POW BD534 (ST00)
7505	933984890682	IC LM358N (ST00)
7541	932218090687	FET POW IRF730B (FSC0)
7542	932204822682	TRA POW 2SC2344E (TSAJ)
7543	932204823682	TRA POW 2SA1011E (TSAJ)
7544	932217439685	TRA SIG SM BC857C (KEC0)
7545	933705890676	TRA SIG BF422 (TOSJ)
7566	932217440685	TRA SIG SM KRC102S (KEC0)
7567	931900234682	IC E-STV9379 (ST00)
7586	933984890682	IC LM358N (ST00)
7587	933221930126	TRA SIG BC637 (PHSE)
7588	933221970126	TRA SIG BC640 (PHSE)
7601	932206519687	TRA POW BUX87 (ST00)
7620	932217996687	FET POW IRF640B (FSC0)
7621	932217996687	FET POW IRF640B (FSC0)
7622	932214562667	FET POW SLA5058 (SAKJ)
7627	932217440685	TRA SIG SM KRC102S (KEC0)
7628	932217440685	TRA SIG SM KRC102S (KEC0)
7629	932217440685	TRA SIG SM KRC102S (KEC0)
7630	932217440685	TRA SIG SM KRC102S (KEC0)
7631	932217440685	TRA SIG SM KRC102S (KEC0)
7632	932217440685	TRA SIG SM KRC102S (KEC0)
7633	932217440685	TRA SIG SM KRC102S (KEC0)
7651	932219556682	IC L5991A (ST00)
7652	933237790126	TRA SIG BC547C (PHSE)
7653	932217439685	TRA SIG SM BC857C (KEC0)
7654	933967310685	TRA SIG SM BC848CLG (ONSE)
7671	934003960126	FET POW BSN254A (PHSE)
7672	932217890687	FET POW IRF740B (FSC0)
7673	932217362682	FET POW FQP7N80 (FSC0)
7674	933237790126	TRA SIG BC547C (PHSE)

PCB Assy

1052	313817881061	VIDEO PCB ASSY(P72)
2702	223858015636	CER2 0805 X7R 50V 10N PM10
2704	203803522801	ELCAP BP NK 160V S 1U PM20
2705	202203100224	ELCAP KM 250V S 1U PM20
2706	242254945382	SURGE PROTECT SGP-201M-DRF
2707	223891015649	CER2 0805 X7R 25V 100N PM10
2708	223891015649	CER2 0805 X7R 25V 100N PM10
2709	223891015649	CER2 0805 X7R 25V 100N PM10
2710	223886115279	CER1 0805 NP0 50V 27P PM5
2720	223886115279	CER1 0805 NP0 50V 27P PM5
2722	223858015636	CER2 0805 X7R 50V 10N PM10
2724	203803522801	ELCAP BP NK 160V S 1U PM20
2725	202203100224	ELCAP KM 250V S 1U PM20
2726	242254945382	SURGE PROTECT SGP-201M-DRF
2727	223891015649	CER2 0805 X7R 25V 100N PM10
2736	223858019814	CER2 0805 Y5V 50V 220N P8020
2740	223886115279	CER1 0805 NP0 50V 27P PM5
2742	223858015636	CER2 0805 X7R 50V 10N PM10
2744	203803522801	ELCAP BP NK 160V S 1U PM20
2745	202203100224	ELCAP KM 250V S 1U PM20
2746	242254945382	SURGE PROTECT SGP-201M-DRF
2748	203803513301	ELCAP RGA 25V S 47U PM20
2749	223891015649	CER2 0805 X7R 25V 100N PM10
2750	223891015649	CER2 0805 X7R 25V 100N PM10
2751	223891015649	CER2 0805 X7R 25V 100N PM10
2752	203803513707	ELCAP RGA 100V S 47U PM20
2753	202203100224	ELCAP KM 250V S 1U PM20
2756	223886115101	CER1 0805 NP0 50V 100P PM5
2757	223886115101	CER1 0805 NP0 50V 100P PM5
2760	223891015649	CER2 0805 X7R 25V 100N PM10
2761	202055800006	CER2 DC E 2KV S 10N P8020
2762	225260214416	CER2 DC X7R 2KV S 470P PM10
2763	225261818021	CER2 DC Y5P 500V S 1N PM10
2764	225271108026	CERHDT F-Y5R 1KV S 1N PM10
2765	225260215216	CER2 DC X7R 2KV S 220P PM10
2766	223858015632	CER2 0805 X7R 50V 4N7 PM10
2767	223891015649	CER2 0805 X7R 25V 100N PM10
2768	223891015649	CER2 0805 X7R 25V 100N PM10
2770	203803527501	ELCAP KM 50V S 10U PM20
2771	223891015649	CER2 0805 X7R 25V 100N PM10
2772	203803513301	ELCAP RGA 25V S 47U PM20
2773	223891015649	CER2 0805 X7R 25V 100N PM10
2774	223891015649	CER2 0805 X7R 25V 100N PM10
2775	203803527204	ELCAP KM 16V S 330U PM20
2776	223891015649	CER2 0805 X7R 25V 100N PM10
2777	203803513301	ELCAP RGA 25V S 47U PM20
2778	223891015649	CER2 0805 X7R 25V 100N PM10
2779	203803513707	ELCAP RGA 100V S 47U PM20
2780	203830250095	CAP MPOL 100V S 100N PM10
2781	202203100224	ELCAP KM 250V S 1U PM20
2782	203830250166	CAP MPOL 400V S 10N PM10
2783	223886115229	CER1 0805 NP0 50V 22P PM5
2784	223886115229	CER1 0805 NP0 50V 22P PM5
2785	223886115229	CER1 0805 NP0 50V 22P PM5
2786	223886115229	CER1 0805 NP0 50V 22P PM5

2787	223891015649	CER2 0805 X7R 25V 100N PM10
2788	223891015649	CER2 0805 X7R 25V 100N PM10
2789	223886115101	CER1 0805 NP0 50V 100P PM5
2790	223886115101	CER1 0805 NP0 50V 100P PM5
2791	203803513201	ELCAP RGA 16V S 100U PM20
2792	223858015632	CER2 0805 X7R 50V 4N7 PM10
2793	223886115101	CER1 0805 NP0 50V 100P PM5
2797	203830250166	CAP MPOL 400V S 10N PM10
2798	203803513201	ELCAP RGA 16V S 100U PM20
2799	223891015649	CER2 0805 X7R 25V 100N PM10
2801	223858015636	CER2 0805 X7R 50V 10N PM10
2802	223886115101	CER1 0805 NP0 50V 100P PM5
2803	223891015649	CER2 0805 X7R 25V 100N PM10
2804	223886115181	CER1 0805 NP0 50V 180P PM5
2805	223891015649	CER2 0805 X7R 25V 100N PM10
2806	223891015649	CER2 0805 X7R 25V 100N PM10
2807	223891015649	CER2 0805 X7R 25V 100N PM10
2811	202203100224	ELCAP KM 250V S 1U PM20
2812	223858015623	CER2 0805 X7R 50V 1N PM10
2813	223858015629	CER2 0805 X7R 50V 3N3 PM10
2814	223891015649	CER2 0805 X7R 25V 100N PM10
2815	223891015649	CER2 0805 X7R 25V 100N PM10
2821	223858015623	CER2 0805 X7R 50V 1N PM10
2822	223858015629	CER2 0805 X7R 50V 3N3 PM10
2831	223858015623	CER2 0805 X7R 50V 1N PM10
2832	223858015629	CER2 0805 X7R 50V 3N3 PM10
3701	232273467509	RST SM 0805 RC12H 75R PM1
3702	232273061479	RST SM 0805 RC11 47R PM5
3703	232273061229	RST SM 0805 RC11 22R PM5
3704	232273061689	RST SM 0805 RC11 68R PM5
3705	213811201105	RST SM 0805 RC05 1M PM5
3706	231291515603	RST MFLM MBB0207 A 56K PM1
3707	213810113224	RST CRB CFR-12 A 220K PM5
3708	213811201823	RST SM 0805 RC05 82K PM5
3709	212010128479	RST CMP ERC12 A 47R PM10
3710	232273061102	RST SM 0805 RC11 1K PM5
3711	213811201123	RST SM 0805 RC05 12K PM5
3712	232273061102	RST SM 0805 RC11 1K PM5
3713	213811201101	RST SM 0805 RC05 100R PM5
3714	213811201101	RST SM 0805 RC05 100R PM5
3715	213811201101	RST SM 0805 RC05 100R PM5
3717	232273061471	RST SM 0805 RC11 470R PM5
3718	232273061471	RST SM 0805 RC11 470R PM5
3721	232273467509	RST SM 0805 RC12H 75R PM1
3722	232273061479	RST SM 0805 RC11 47R PM5
3723	232273061229	RST SM 0805 RC11 22R PM5
3724	232273061689	RST SM 0805 RC11 68R PM5
3725	213811201105	RST SM 0805 RC05 1M PM5
3726	231291515603	RST MFLM MBB0207 A 56K PM1
3727	213810113224	RST CRB CFR-12 A 220K PM5
3728	213811201823	RST SM 0805 RC05 82K PM5
3729	212010128479	RST CMP ERC12 A 47R PM10
3730	232273061102	RST SM 0805 RC11 1K PM5
3731	213811201123	RST SM 0805 RC05 12K PM5
3732	213811201222	RST SM 0805 RC05 2K2 PM5
3733	232273061181	RST SM 0805 RC11 180R PM5
3734	213811201101	RST SM 0805 RC05 100R PM5
3735	232273061471	RST SM 0805 RC11 470R PM5
3736	213811201101	RST SM 0805 RC05 100R PM5
3737	213811201105	RST SM 0805 RC05 1M PM5
3738	213811201105	RST SM 0805 RC05 1M PM5
3741	232273467509	RST SM 0805 RC12H 75R PM1
3742	232273061479	RST SM 0805 RC11 47R PM5
3743	232273061229	RST SM 0805 RC11 22R PM5
3744	232273061689	RST SM 0805 RC11 68R PM5
3745	213811201105	RST SM 0805 RC05 1M PM5
3746	231291515603	RST MFLM MBB0207 A 56K PM1
3747	213810113224	RST CRB CFR-12 A 220K PM5
3748	213811201823	RST SM 0805 RC05 82K PM5
3749	212010128479	RST CMP ERC12 A 47R PM10
3750	232273061102	RST SM 0805 RC11 1K PM5
3751	213811201123	RST SM 0805 RC05 12K PM5
3755	213811291002	RST SM 0805 JUMP. MAX 0R05
3760	212010128153	RST CMP ERC12 A 15K PM10
3761	231291511503	RST MFLM MBB0207 A 15K PM1
3763	212010128152	RST CMP ERC12 A 1K5 PM10
3765	231291511804	RST MFLM MBB0207 A 180K PM1
3766	213811201101	RST SM 0805 RC05 100R PM5
3767	213811201101	RST SM 0805 RC05 100R PM5
3768	232273061102	RST SM 0805 RC11 1K PM5
3769	213811201152	RST SM 0805 RC05 1K5 PM5
3783	232273061102	RST SM 0805 RC11 1K PM5
3785	232273061102	RST SM 0805 RC11 1K PM5
3786	213811201103	RST SM 0805 RC05 10K PM5
3787	213811201332	RST SM 0805 RC05 3K3 PM5
3788	213811201101	RST SM 0805 RC05 100R PM5
3789	213811201101	RST SM 0805 RC05 100R PM5
3790	213811201103	RST SM 0805 RC05 10K PM5
3791	213811201332	RST SM 0805 RC05 3K3 PM5
3792	232273464702	RST SM 0805 RC12H 4K7 PM1
3801	213811201472	RST SM 0805 RC05 4K7 PM5
3802	232273061562	RST SM 0805 RC11 5K6 PM5
3803	213811201472	RST SM 0805 RC05 4K7 PM5
3804	213811201105	RST SM 0805 RC05 1M PM5
3805	213811201103	RST SM 0805 RC05 10K PM5
3806	213811201331	RST SM 0805 RC05 330R PM5
3807	232273061153	RST SM 0805 RC11 15K PM5
3808	213811201123	RST SM 0805 RC05 12K PM5
3809	213811201224	RST SM 0805 RC05 220K PM5
3811	213811201184	RST SM 0805 RC05 180K PM5
3812	232273061684	RST SM 0805 RC11 680K PM5
3813	232273061473	RST SM 0805 RC11 47K PM5
3815	213811201103	RST SM 0805 RC05 10K PM5
3816	232273061102	RST SM 0805 RC11 1K PM5
3821	213811201184	RST SM 0805 RC05 180K PM5
3822	232273061684	RST SM 0805 RC11 680K PM5
3823	232273061473	RST SM 0805 RC11 47K PM5
3825	213811201103	RST SM 0805 RC05 10K PM5
3831	213811201184	RST SM 0805 RC05 180K PM5
3832	232273061684	RST SM 0805 RC11 680K PM5
3833	232273061473	RST SM 0805 RC11 47K PM5
3835	213811201103	RST SM 0805 RC05 10K PM5
3836	213811201103	RST SM 0805 RC05 10K PM5
3841	213811201103	RST SM 0805 RC05 10K PM5
3842	213811201103	RST SM 0805 RC05 10K PM5
3843	213811201103	RST SM 0805 RC05 10K PM5
3844	213811201103	RST SM 0805 RC05 10K PM5
3845	213811201101	RST SM 0805 RC05 100R PM5
3846	213811201101	RST SM 0805 RC05 100R PM5
5701	242253597069	IND FXD SP0305 A 4U7 PM10
5702	242253594937	IND FXD SPT0406 A 0U12 PM10
5703	242254944197	IND FXD 0805 EMI 100MHZ 220R
5704	313816879121	FERRITE BEAD SMD (FB423226T-Y
5721	242253594937	IND FXD SPT0406 A 0U12 PM10
5722	242254944197	IND FXD 0805 EMI 100MHZ 220R
5731	242253594937	IND FXD SPT0406 A 0U12 PM10
5732	242254944197	IND FXD 0805 EMI 100MHZ 220R
5733	242254944197	IND FXD 0805 EMI 100MHZ 220R
5734	242253597069	IND FXD SP0305 A 4U7 PM10
5735	242254944197	IND FXD 0805 EMI 100MHZ 220R
5736	242254944197	IND FXD 0805 EMI 100MHZ 220R
5737	242254944197	IND FXD 0805 EMI 100MHZ 220R
5760	313816874511	FERRITE BEAD
5761	242254944197	IND FXD 0805 EMI 100MHZ 220R
5762	242254944197	IND FXD 0805 EMI 100MHZ 220R
5763	242254944197	IND FXD 0805 EMI 100MHZ 220R
5764	242254944197	IND FXD 0805 EMI 100MHZ 220R
5765	242254944197	IND FXD 0805 EMI 100MHZ 220R
5766	242253597069	IND FXD SP0305 A 4U7 PM10
5767	313816874511	FERRITE BEAD
5768	242254942026	IND FXD BEAD EMI 100MHZ 50R
5782	242253597069	IND FXD SP0305 A 4U7 PM10
5783	313817878601	BEAD 07UH VERT.
5791	242253597069	IND FXD SP0305 A 4U7 PM10
5801	242254944197	IND FXD 0805 EMI 100MHZ 220R
6701	933952580685	DIO SIG SM BAV103 (VISH)
6702	933952580685	DIO SIG SM BAV103 (VISH)
6703	933952580685	DIO SIG SM BAV103 (VISH)
6704	933952580685	DIO SIG SM BAV103 (VISH)
6705	933913910115	DIO SIG SM BAS32L (PHSE)
6721	933952580685	DIO SIG SM BAV103 (VISH)
6722	933952580685	DIO SIG SM BAV103 (VISH)
6723	933952580685	DIO SIG SM BAV103 (VISH)
6724	933952580685	DIO SIG SM BAV103 (VISH)
6725	933913910115	DIO SIG SM BAS32L (PHSE)
6731	933913910115	DIO SIG SM BAS32L (PHSE)
6732	932209863685	DIO SIG SM BAV99 (VISH)
6741	933952580685	DIO SIG SM BAV103 (VISH)
6742	933952580685	DIO SIG SM BAV103 (VISH)
6743	933952580685	DIO SIG SM BAV103 (VISH)
6744	933952580685	DIO SIG SM BAV103 (VISH)
6745	933913910115	DIO SIG SM BAS32L (PHSE)
6761	932213642673	DIO REC BYT42G A (VISH)
6762	933500820133	DIO REG BZV85-C51 A (PHSE)
6801	933913910115	DIO SIG SM BAS32L (PHSE)
6802	933913910115	DIO SIG SM BAS32L (PHSE)
6803	933913910115	DIO SIG SM BAS32L (PHSE)
6811	933137380215	DIO REG SM BZX84-C4V7 (PHSE)
6812	933913910115	DIO SIG SM BAS32L (PHSE)
6813	932209863685	DIO SIG SM BAV99 (VISH)
6821	933137380215	DIO REG SM BZX84-C4V7 (PHSE)
6822	933913910115	DIO SIG SM BAS32L (PHSE)
6823	932209863685	DIO SIG SM BAV99 (VISH)
6831	933137380215	DIO REG SM BZX84-C4V7 (PHSE)
6832	933913910115	DIO SIG SM BAS32L (PHSE)
6833	932209863685	DIO SIG SM BAV99 (VISH)
7701	935264061112	IC TDA4887PS/V1 (PHSE)
7705	932220610682	IC LM2412T (NSC0)
7706	933705890676	TRA SIG BF422 (TOSJ)
7707	933705890676	TRA SIG BF422 (TOSJ)
7726	933705890676	TRA SIG BF422 (TOSJ)
7727	933705890676	TRA SIG BF422 (TOSJ)
7746	933705890676	TRA SIG BF422 (TOSJ)
7747	933705890676	TRA SIG BF422 (TOSJ)
7781	932222161682	IC WT6805-NC160PH-19A (WESE)
7782	932209265685	TRA SIG SM MUN2211JG (ONSE)
7783	932209265685	TRA SIG SM MUN2211JG (ONSE)
7801	932203171682	IC TL072CP (TI00)
7802	933669110652	IC 74HC4066N (PHSE)
7803	933878830676	TRA SIG BF423 (TOSJ)
7804	933878830676	TRA SIG BF423 (TOSJ)
7805	933878830676	TRA SIG BF423 (TOSJ)
7806	933706060112	IC PCF8574P (PHSE)
7807	933967310685	TRA SIG SM BC848CLG (ONSE)
7808	933878830676	TRA SIG BF423 (TOSJ)
7809	933878830676	TRA SIG BF423 (TOSJ)
7810	933878830676	TRA SIG BF423 (TOSJ)

PCB Assy

1053	313817881041	DRIVE PCB ASSY(P72)
2214	202202000906	ELCAP SM 16V S 47U PM20
2215	225236512104	CER2 ML Y5V 50V S 100N P8020
2216	202202000906	ELCAP SM 16V S 47U PM20
2217	225236512104	CER2 ML Y5V 50V S 100N P8020
2218	202202000906	ELCAP SM 16V S 47U PM20
2219	225250508205	CER1 DC NP0 50V S 22P PM5
2220	225250508205	CER1 DC NP0 50V S 22P PM5
2239	203803521311	ELCAP GS 25V S 470U PM20
2241	202202000912	ELCAP SM 25V S 2U2 PM20
2242	202202000912	ELCAP SM 25V S 2U2 PM20
2244	202202000912	ELCAP SM 25V S 2U2 PM20
2245	202202000912	ELCAP SM 25V S 2U2 PM20
2246	202202000912	ELCAP SM 25V S 2U2 PM20
2247	202202000912	ELCAP SM 25V S 2U2 PM20
2251	203803521311	ELCAP GS 25V S 470U PM20
2252	203803521215	ELCAP GS 16V S 470U PM20
3220	212211600351	RST MFLM MF0207 A 4K7 PM1
3238	212211000401	RST MFLM MF1/2WS A 47K PM1
3239	212211000401	RST MFLM MF1/2WS A 47K PM1
3241	212211000392	RST MFLM MF1/2WS A 22K PM1
3242	212211000392	RST MFLM MF1/2WS A 22K PM1
3244	212211000392	RST MFLM MF1/2WS A 22K PM1
3245	212211000392	RST MFLM MF1/2WS A 22K PM1
3246	212211000392	RST MFLM MF1/2WS A 22K PM1
3247	212211000392	RST MFLM MF1/2WS A 22K PM1
3265	231291511304	RST MFLM MBB0207 A 130K PM1
3266	231291515602	RST MFLM MBB0207 A 5K6 PM1
3267	231291511304	RST MFLM MBB0207 A 130K PM1

Spare Parts List

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3268	231291515602	RST MFLM MBB0207 A 5K6 PM1
3269	231291511304	RST MFLM MBB0207 A 130K PM1
3270	212211000592	RST MFLM MF1/2WS A 2K35 PM1
3271	231291511304	RST MFLM MBB0207 A 130K PM1
3272	212211000592	RST MFLM MF1/2WS A 2K35 PM1
3273	231291511304	RST MFLM MBB0207 A 130K PM1
3274	212211000592	RST MFLM MF1/2WS A 2K35 PM1
3275	231291511304	RST MFLM MBB0207 A 130K PM1
3276	212211000592	RST MFLM MF1/2WS A 2K35 PM1
3289	231291516809	RST MFLM MBB0207 A 68R PM1
3290	231291516809	RST MFLM MBB0207 A 68R PM1
3292	231291516809	RST MFLM MBB0207 A 68R PM1
3293	231291516809	RST MFLM MBB0207 A 68R PM1
3295	231291516809	RST MFLM MBB0207 A 68R PM1
3296	231291516809	RST MFLM MBB0207 A 68R PM1
6207	933416590673	DIO REG BZX55-C5V6 A (VISH)
6208	933416590673	DIO REG BZX55-C5V6 A (VISH)
7204	932220364682	IC WT61P4-K420WT-000 (WESE)
7208	935262849112	IC TDA7073A/N4 (PHSE)
7209	935262849112	IC TDA7073A/N4 (PHSE)

PCB Assy

1054	313817881141	CONTROL PCB ASSY(P72)
2891	223891015649	CER2 0805 X7R 25V 100N PM10
2892	223891015649	CER2 0805 X7R 25V 100N PM10
2893	223891015649	CER2 0805 X7R 25V 100N PM10
3891	231291511004	RST MFLM MBB0207 A 100K PM1
3892	231291515603	RST MFLM MBB0207 A 56K PM1
3893	212211600351	RST MFLM MF0207 A 4K7 PM1
3894	231291511503	RST MFLM MBB0207 A 15K PM1
3895	212211600367	RST MFLM MF0207 A 24K PM1
5891	242254944197	IND FXD 0805 EMI 100MHZ 220R
6891	932214603682	LED VS L-3WYGW (KIEL)

PCB Assy

1055	313817881161	TERMINAL PCB ASSY(P72)
2001	202202000697	ELCAP SEA 10V S 220U PM20
2002	202202000885	ELCAP SH 16V S 220U PM20
2003	202202000606	ELCAP SEA 16V S 47U PM20
2004	202202000606	ELCAP SEA 16V S 47U PM20
2005	202202000606	ELCAP SEA 16V S 47U PM20
2007	202202000606	ELCAP SEA 16V S 47U PM20
2008	223891015649	CER2 0805 X7R 25V 100N PM10
2010	223891015649	CER2 0805 X7R 25V 100N PM10
2011	202202000606	ELCAP SEA 16V S 47U PM20
2013	202202000606	ELCAP SEA 16V S 47U PM20
2017	223891015649	CER2 0805 X7R 25V 100N PM10
2018	223886115109	CER1 0805 NP0 50V 10P PM5
2019	223886115109	CER1 0805 NP0 50V 10P PM5
2020	223886115109	CER1 0805 NP0 50V 10P PM5
2021	223886115109	CER1 0805 NP0 50V 10P PM5
2022	223891015649	CER2 0805 X7R 25V 100N PM10
2023	202202000697	ELCAP SEA 10V S 220U PM20
2024	223891015649	CER2 0805 X7R 25V 100N PM10
2025	202202000697	ELCAP SEA 10V S 220U PM20
2027	202202000697	ELCAP SEA 10V S 220U PM20
2031	223886115229	CER1 0805 NP0 50V 22P PM5
2032	223886115229	CER1 0805 NP0 50V 22P PM5
2033	223886115229	CER1 0805 NP0 50V 22P PM5
2034	223886115229	CER1 0805 NP0 50V 22P PM5
2035	223891015649	CER2 0805 X7R 25V 100N PM10
2036	223891015649	CER2 0805 X7R 25V 100N PM10
2037	223891019854	CER2 0805 Y5V 25V 220N P8020
3001	213811201222	RST SM 0805 RC05 2K2 PM5
3004	213811201222	RST SM 0805 RC05 2K2 PM5
3006	232273061479	RST SM 0805 RC11 47R PM5
3007	232273467509	RST SM 0805 RC12H 75R PM1
3008	232273061479	RST SM 0805 RC11 47R PM5
3009	232273467509	RST SM 0805 RC12H 75R PM1
3010	232273061479	RST SM 0805 RC11 47R PM5
3011	232273467509	RST SM 0805 RC12H 75R PM1
3012	232273061471	RST SM 0805 RC11 470R PM5
3013	232273061471	RST SM 0805 RC11 470R PM5
3014	232273061471	RST SM 0805 RC11 470R PM5
3015	232273061471	RST SM 0805 RC11 470R PM5
3016	232273061479	RST SM 0805 RC11 47R PM5
3017	232273467509	RST SM 0805 RC12H 75R PM1
3018	213811201222	RST SM 0805 RC05 2K2 PM5
3019	232273061479	RST SM 0805 RC11 47R PM5
3020	232273467509	RST SM 0805 RC12H 75R PM1
3021	232273061479	RST SM 0805 RC11 47R PM5
3022	232273467509	RST SM 0805 RC12H 75R PM1
3023	213811201222	RST SM 0805 RC05 2K2 PM5
3024	213811201221	RST SM 0805 RC05 220R PM5
5001	242253597069	IND FXD SP0305 A 4U7 PM10
5002	242253597069	IND FXD SP0305 A 4U7 PM10
5003	242253597069	IND FXD SP0305 A 4U7 PM10
7001	932214260682	IC AN5870-PV (MATJ)

PCB Assy

1056	313817881151	MHR PCB ASSY(P72)
2192	203803521502	ELCAP GS 50V S 22U PM20
2193	203803521603	ELCAP GS 63V S 22U PM20
2194	203803521209	ELCAP GS 16V S 220U PM20
2195	222236555223	CAP MPOL 400V S 22N PM10
3191	212211000382	RST MFLM MF1/2WS A 9K1 PM1
3192	212211600361	RST MFLM MF0207 A 12K PM1
3193	212010590779	RST MOX 1W RSS A 270R PM5
5191	313816872691	MAINS HARMONIC COIL
5192	243853598058	IND FXD BEAD EMI 100MHZ 80R
6191	933083990133	DIO SIG 1N4148 A (PHSE)
6192	933189210133	DIO SIG BAV21 A (PHSE)
6193	933189210133	DIO SIG BAV21 A (PHSE)
6194	933083990133	DIO SIG 1N4148 A (PHSE)
7191	933179600126	TRA SIG BC337-40 (PHSE)

Recommended Parts List

Recommended Parts List of 202P70/00

1	313812755241	FRONT CABINET ASSY
2	313812755261	BACK COVER ASSY
3	313810798481	PEDESTAL ASSY
22	313818872531	SHIELD BOTTOM ASSY
41	313810463051	FRONT CABINET
42	313810450403	BACK COVER
153	313810658051	P.E.BAG/ E-D.F.U.
450	313810663821	CARTON
451	313810657101	CUSHION - TOP FRONT
452	313810657112	CUSHION - TOP REAR
453	313810657121	CUSHION - BOTTOM
454	313810645301	PE BAG
601	313811707744	E-D.F.U. ASSY
602	313811707754	E-D.F.U.
1050	823827446721	CRT M51QEQ991X001(TCO/DFT)
1051	313817881051	MAIN PCB ASSY(P72)
1052	313817881061	VIDEO PCB ASSY(P72)
1053	313817881041	DRIVE PCB ASSY(P72)
1054	313817881141	CONTROL PCB ASSY(P72)
1055	313817881161	TERMINAL PCB ASSY(P72)
1056	313817881151	MHR PCB ASSY(P72)
1057	313816874231	MAINS CORD
1058	313819870601	CORD SUB-D 15/1M8/15 D-SUB GY
1103	242208600208	FUSE 5X20 HT 4A 250V IEC
5132	242253600036	IND FXD TSL0808 S 100U PM10
5501	313819870561	TFM SIG DRIVER LS-PH03D-001
5502	313816874061	BEAD BF30UTA-3.5X5X1B
5541	313819870571	TFM SIG DRIVER LS-PH03F-004
5544	313816873531	CHOCK COIL(SRW25EF-T01V001)
5670	242253597069	IND FXD SP0305 A 4U7 PM10
5671	242253100092	TFM LOT LAYER CF2145A
5672	242253600036	IND FXD TSL0808 S 100U PM10
5722	242254944197	IND FXD 0805 EMI 100MHZ 220R
5763	242254944197	IND FXD 0805 EMI 100MHZ 220R
5782	242253597069	IND FXD SP0305 A 4U7 PM10
5783	313817878601	BEAD 07UH VERT.
7001	932214260682	IC AN5870-PV (MATJ)
7121	932214576682	IC STR-F6656(LF1352) (SAKJ)
7143	932209200687	IC L4940V5 (ST00)
7155	932208367676	IC TL431CZ S (ST00)
7204	932220364682	IC WT61P4-K420WT-000 (WESE)
7208	935262849112	IC TDA7073A/N4 (PHSE)
7209	935262849112	IC TDA7073A/N4 (PHSE)
7301	823827446731	CPU,IC 6160-K420PH-06A
7336	932214725682	IC M24C16-WBN6P (ST00)
7363	933504020682	IC L7812CV (ST00)
7364	932208834687	IC MC7808ACT (ONSE)
7404	933282660652	IC HEF4053BP (PHSE)
7421	935273064112	IC TDA4856/V6 (PHSE)
7505	933984890682	IC LM358N (ST00)
7567	931900234682	IC E-STV9379 (ST00)
7586	933984890682	IC LM358N (ST00)
7651	932219556682	IC L5991A (ST00)
7701	935264061112	IC TDA4887PS/V1 (PHSE)
7705	932220610682	IC LM2412T (NSC0)
7781	932222161682	IC WT6805-NC160PH-19A (WESE)
7801	932203171682	IC TL072CP (TI00)
7802	933669110652	IC 74HC4066N (PHSE)
7806	933706060112	IC PCF8574P (PHSE)

GENERAL PRODUCT SPECIFICATION

P72 202P7
GENERAL PRODUCT
SPECIFICATION

- MICRO PROCESSOR-BASED DIGITAL CONTROL WITH 36 FACTORY MODES, 9 PRESET MODES AND 16 USER MODES TO ENSURE PICTURE CONFIGURATIONS ARE ALWAYS MAINTAINED WHEN SWITCH BETWEEN COMMON VIDEO MODES AND USER DEFINED CUSTOM MODES.
- USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION/ADJUSTMENT
- DDC2B COMMUNICATION CAPABILITY
- MAX. RESOLUTION 2048 X 1536 NON-INTERLACED AT 80 HZ
- 21" 0.25 MM PITCH SM FLAT PICTURE TUBE.
- EASY TILT & SWIVEL BASE
- FULL RANGE POWER SUPPLY 90 - 264 VAC
- CE ENVIRONMENTAL POLICY
- FLAT SQUARE TUBE TO REDUCE LIGHT REFLECTION
- POWER MANAGEMENT CAPABILITY
- LOW EMISSION TCO 99 / TCO'03
- MOIRE' CANCELLATION
- AUTO CALIBRATE FUNCTION
- sRGB

CLASS NO.	21"AUTO SCAN CMTR-P72-202P7 TYPE : 202P70/00 BRAND : PHILIPS	8639 000 16171
2005-03-25		
NAME C.C. Liao	SUPERS. 21	590 — 1 10 A4
TY CHECK	DATE 2005-03-25	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.

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CONTENTS

GENERAL PRODUCT SPECIFICATION

1.0 FOREWORD

This specification describes a 21" high resolution digitally controlled auto scan color monitor with max. resolution up to 2048x1536/80Hz non-interlaced.

2.0 PRODUCT PROFILE

This display monitor unit is a complete color display monitor enclosed in PHILIPS global styling cabinet which has an integrated tilt and swivel base.

2.1 CRT

Type NR. : M51QEQ991X001 (SDI / TCO / DFT)
Dimensions : 21"
Phosphor Pitch (mm) : 0.25 mm
Phosphor : P22
Deflection angle : 90 deg
Light transmission : 54.5 %

Surface of plate : Spin coating (TCO & Anti static)
EHT : 27.0 KV
Useful screen (mm) : 406.4 x 304.8

2.2 Scanning frequencies

Horizontal: 30 - 130KHz Vertical: 50 - 160 Hz

2.3 Video dot rate: 355.03MHz

2.4 Power input : 90 - 264 Vac, 47-63 Hz

2.5 Power consumption : 125W typ.

2.6 Dimensions : 501(W) x 501.8(H) x 465.8(D) mm

2.7 Weight : 16.5 kg

2.8 Functions :

(1) TTL - H / V separate or H+V Composite Sync, Analog SOG.

(2) Automatic (after power on) and manual degaussing circuit.

2.9 Ambient temperature : 5 - 35 °C

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2.10 Regulatory compliance :

(1) Safety : UL 60950
: CSA C22.2 NO. 950
: IEC950/ EN60950

(2) EMI : FCC PART 15 class B
: D.O.C. Class B
: EN55022 Class B
: CE mark
: CNS 13438

EMS : EN55024
EN61000-4-3 (80% 1KHz AM modulation) picture jitter < 3mm

(3) X-RAY Radiation requirement / regulation
: DHHS 21 CFR Subchapter J.
: ROEV / 08.01.1987

(4) Low Radiation
: TCO99 / TCO'03

(5) Environmental
: Per CE and BU policy

(6) Ergonomic Requirements
: EK1-ITB 2000
: ISO 9241-3 / 7 / 8

(7) Harmonic distortion regulation: EN 61000-3-2

(8) Flicker :EN61000-3-3

3.0 Electrical characteristics

3.1 Interface signals

The input signals can be applied in three different modes:

1). Video, H-sync & V-sync
2). Video & Composite Sync
3). Video with Sync On Green (composite Green video).

Video : 0.7 Vp-p, input impedance, 75 ohm

Sync. : Separate sync — TTL level, input impedance 2k2 ohm
Hor. sync — Positive/Negative
Ver. sync — Positive/Negative

Composite sync — TTL level, input impedance 2k2 ohm
Positive/Negative

Sync On Green — Composite Green video, 0.3 Vp-p for sync part.
(This function can be enabled or disabled by a hardware switch on the rear side of back cover.)

3.2 Interface

3.2.1 Cable

The input signals are applied to the display through a detachable shielded cable.
Length : 1.8 m +/- 50 mm (detachable)
Connector type : 15 pin D-Sub male to 15 pin D-Sub male, blue IBM PS/2 standard (3 rows) with DDC2B pin assignments.

GENERAL PRODUCT SPECIFICATION

3.2.2 Input connectors

- BNC input connectors (rear)

1	Red video input
2	Green video input (Green video with Sync On Green input)
3	Blue video input
4	H/H+V sync
5	V sync

- 15 pin D-sub connector (rear)

pin assignments :

pin no.	
1	Red video input
2	Green video input (Green video with Sync On Green input)
3	Blue video input
4	Optional - connected to pin 10
5	Not connected
6	Red video ground
7	Green video ground
8	Blue video ground
9	+5V
10	Sync ground
11	Optional - connected to pin 10
12	Bi-directional data (SDA)
13	H/H+V sync
14	V sync (VCLK)
15	Data clock (SCL)

3.2.3 Adaptor 15 pin D-standard (2 rows male) to 15 pin D-sub (female) for Apple MacIntosh II use (optional).

pin assignments :

pin no	15 Pin D-standard
1	RED GND
2	RED VIDEO
3	COMPOSITE SYNC
4	SYNC GND
5	GREEN VIDEO (Green video with Sync On Green input)
6	GREEN GND
7	NC
8	NC
9	BLUE VIDEO
10	NC
11	NC
12	NC
13	BLUE GND
14	NC
15	NC

3.2.4 Software control functions via OSD/control

- Adjustable functions:

Main Controls
Language
Input signal selection
Zoom
Adjust horizontal
Adjust vertical
Adjust shape
Adjust color
Reset to factory settings
Extra Controls
Close Main Controls
Move selection then "OK"

Language
-Language: multi-language (8 languages)

Input
-Input signal selection

Zoom
- Zoom

Adjust horizontal
-Adjust position
-Adjust size

Adjust vertical
-Adjust position
-Adjust size

Adjust shape
-Adjust side curve
Pincushion
Balanced
-Adjust side angles
Trapezoid
Parallelogram
-Rotate image
Rotate

Adjust color
-9300 °K for general use
-6500 °K for image management
-5500 °K for photoretouch
-sRGB
-Smart mode
-Professional mode

Reset to factory settings
- No
-Yes

Extra Controls
- Adjust moire
Horizontal
Vertical
-Degauss
-Adjust convergence
Horizontal
Vertical
-Adjust purity
NS purity
-Auto calibrate OFF AUTO

3.3 Timing requirement

3.3.1 Mode storing capacity

Total factory modes	: 36
Preset modes	: 9
Preload modes	: 27
User modes	: 16

The 9 preset modes are listed in 4.2, page17.

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GENERAL PRODUCT SPECIFICATION

3.3.2 Factory preset timings

The 36 factory modes detailed timings are according to the tables as below,the timing charts refer to FIG-8 & FIG-9.

MODE NO.	1	2	3	4
RESOLUTION	640 x 480	720 x 400	640 x 480	640 x 480
Dot clock(MHz)	25.175	28.321	31.500	31.500
f h	31.469 kHz	31.468 kHz	37.500 KHz	37.861 kHz
A (us)	31.778	31.778	26.667	26.413
B (us)	3.813	3.813	2.032	1.270
C (us)	1.907	1.907	3.810	3.810
D (us)	25.422	25.423	20.317	20.317
E (us)	0.636	0.325	0.508	1.016
f v	59.941 Hz	70.084 Hz	75.000 Hz	72.810 Hz
O (ms)	16.683	14.268	13.333	13.735
P (ms)	0.064	0.064	0.080	0.079
Q (ms)	1.049	1.112	0.427	0.528
R (ms)	15.253	12.711	12.800	12.678
S (ms)	0.317	0.382	0.026	0.45
SYNC. H/V POLARITY	- / -	- /+	- /-	- / -
SEP . SYNC	Y	Y	Y	Y

MODE NO.	5	6	7	8
RESOLUTION	800x600	640 x 480	800 x 600	800 x 600
Dot clock(MHz)	40.000	36.000	49.500	50.000
f h	37.879 kHz	43.269 kHz	46.875 kHz	48.077 kHz
A (us)	26.400	23.111	21.333	20.800
B (us)	3.200	1.556	1.616	2.400
C (us)	2.200	2.222	3.232	1.280
D (us)	20.000	17.778	16.162	16.000
E (us)	1.000	1.555	0.323	1.12
f v	60.317Hz	85.008 Hz	75.000 Hz	72.188 Hz
O (ms)	16.579	11.763	13.333	13.853
P (ms)	0.106	0.069	0.064	0.125
Q (ms)	0.607	0.578	0.448	0.478
R (ms)	15.840	11.093	12.800	12.480
S (ms)	0.026	0.023	0.021	0.77
SYNC. H/V POLARITY	+ / +	- / -	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

MODE NO.	9	10	11	12
RESOLUTION	1024 x 768	832 x 624	640 x 480	800 x 600
Dot clock(MHz)	65.000	57.280	40.500	56.250
f h	48.363 kHz	49.722 kHz	50.628 kHz	53.674 kHz
A (us)	20.677	20.110	19.752	18.631
B (us)	2.092	1.117	1.580	1.138
C (us)	2.462	3.910	1.975	2.702
D (us)	15.754	14.520	15.802	14.222
E (us)	0.369	0.563	0.395	0.569
f v	60.004 Hz	74.546 Hz	100.10 Hz	85.061 Hz
O (ms)	16.666	13.410	9.995	11.756
P (ms)	0.124	0.060	0.059	0.056
Q (ms)	0.600	0.784	0.435	0.503
R (ms)	15.880	12.550	9.481	11.179
S (ms)	0.062	0.016	0.020	0.018
SYNC. H/V POLARITY	- / -	+ /+	- / -	+ / +
SEP . SYNC	Y	Y	Y	Y

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MODE NO.	13	14	15	16
RESOLUTION	1024 x 768	1792 x 1344	1024 x 768	800 x 600
Dot clock(MHz)	75.000	295.520	78.750	67.500
f h	56.476 kHz	119.935KHz	60.023 kHz	63.923 kHz
A (us)	17.707	8.338	16.660	15.644
B (us)	1.813	0.677	1.219	0.948
C (us)	1.920	1.137	2.235	2.370
D (us)	13.653	6.064	13.003	11.852
E (us)	0.321	0.460	0.203	0.474
f v	70.069 Hz	85.000Hz	75.029 Hz	100.00 Hz
O (ms)	14.272	11.765	13.328	9.997
P (ms)	0.016	0.025	0.050	0.047
Q (ms)	0.513	0.525	0.466	0.548
R (ms)	13.599	11.206	12.795	9.387
S (ms)	0.054	0.008	0.017	0.015
SYNC. H/V POLARITY	- / -	+ / +	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

MODE NO.	17	18	19	20
RESOLUTION	1280 x 1024	1024 x 768	1152 x 870	1856 x 1392
Dot clock(MHz)	108.000	94.500	100.000	317.914
f h	63.981 kHz	68.677 kHz	68.681 kHz	124.185KHz
A (us)	15.630	14.561	14.560	8.053
B (us)	1.037	1.016	1.280	0.654
C (us)	2.296	2.201	1.440	1.107
D (us)	11.852	10.836	11.520	5.838
E (us)	0.445	0.508	0.32	0.453
f v	60.020 Hz	84.997 Hz	74.979 Hz	85.000Hz
O (ms)	16.661	11.765	13.333	11.765
P (ms)	0.047	0.044	0.044	0.024
Q (ms)	0.594	0.524	0.568	0.523
R (ms)	16.005	11.183	12.678	11.209
S (ms)	0.015	0.014	0.043	0.008
SYNC. H/V POLARITY	+ / +	+ / +	- / -	+ / +
SEP . SYNC	Y	Y	Y	Y

MODE NO.	21	22	23	24
RESOLUTION	1920 x1440	1600 x 1200	1280 x1024	1600 x 1200
Dot clock(MHz)	341.349	162.000	135.00	175.500
f h	128.520KHz	75.000 kHz	79.976 kHz	81.250 kHz
A (us)	7.781	13.333	12.504	12.308
B (us)	0.633	1.185	1.067	1.094
C (us)	1.078	1.877	1.837	1.732
D (us)	5.625	9.877	9.481	9.117
E (us)	0.445	0.394	0.119	0.365
f v	85.000Hz	60.000 Hz	75.024 Hz	65.000 Hz
O (ms)	11.765	16.667	13.329	15.385
P (ms)	0.023	0.040	0.038	0.037
Q (ms)	0.529	0.613	0.475	0.566
R (ms)	11.205	16.000	12.804	14.769
S (ms)	0.008	0.014	0.012	0.013
SYNC. H/V POLARITY	+ /+	+ / +	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

GENERAL PRODUCT SPECIFICATION

MODE NO.	25	26	27	28
RESOLUTION	1792 x 1344	1920 x1440	1856 x 1392	1600 x 1200
Dot clock(MHz)	204.750	320.207	218.250	189.000
f h	83.640 kHz	120.56HKz	86.333 kHz	87.500 kHz
A (us)	11.956	8.295	11.583	11.429
B (us)	0.977	0.675	1.026	1.016
C (us)	1.602	1.149	1.489	1.608
D (us)	8.752	5.996	8.504	8.466
E (us)	0.625	0.475	0.564	0.339
f v	59.999 Hz	80.000Hz	59.995 Hz	70.000 Hz
O (ms)	16.667	12.50	16.668	14.286
P (ms)	0.036	0.025	0.035	0.034
Q (ms)	0.550	0.523	0.498	0.526
R (ms)	16.069	11.944	16.124	13.715
S (ms)	0.012	0.008	0.011	0.011
SYNC. H/V POLARITY	+ / +	+ / +	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

MODE NO.	29	30	31	32
RESOLUTION	1920 x 1440	1280 x 1024	1600 x 1200	1600 x 1200
Dot clock(MHz)	234.000	157.500	202.500	229.500
f h	90.000 kHz	91.146 kHz	93.750 kHz	106.250 kHz
A (us)	11.111	10.971	10.667	9.412
B (us)	0.889	1.016	0.948	0.837
C (us)	1.470	1.422	1.501	1.325
D (us)	8.205	8.127	7.901	6.972
E (us)	0.547	0.406	0.317	0.278
f v	60.000 Hz	85.024 Hz	75.000 Hz	85.000 Hz
O (ms)	16.667	11.761	13.334	11.765
P (ms)	0.033	0.033	0.032	0.028
Q (ms)	0.622	0.483	0.491	0.433
R (ms)	16.000	11.234	12.800	11.294
S (ms)	0.012	0.011	0.011	0.01
SYNC. H/V POLARITY	+ / +	+ / +	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

MODE NO.	33	34	35	36
RESOLUTION	1792 x 1344	1920 x 1440	2048 x 1536	2048 x 1536
Dot clock(MHz)	261.000	297.000	319.915	355.03
f h	106.270 kHz	112.5 kHz	120.450 kHz	130KHz
A (us)	9.410	8.889	8.302	7.692
B (us)	0.828	0.754	0.675	0.625
C (us)	1.349	1.185	1.025	0.949
D (us)	6.866	6.465	6.402	5.769
E (us)	0.367	0.485	0.200	0.349
f v	74.997 Hz	75.000 Hz	75.000 Hz	80Hz
O (ms)	13.334	13.333	13.333	12.5
P (ms)	0.028	0.027	0.025	0.023
Q (ms)	0.649	0.498	0.548	0.508
R (ms)	12.647	12.800	12.752	11.815
S (ms)	0.01	0.008	0.008	0.154
SYNC. H/V POLARITY	+ / +	+ / +	+ / +	+ / +
SEP . SYNC	Y	Y	Y	Y

CLASS NO.

21"AUTO SCAN CMTR-P72-202P7
TYPE : 202P70/00
BRAND : PHILIPS

8639 000 16171

2005-03-25
NAME C.C. Liao
SUPERS.
21
590 — 9
10
A4
TY
CHECK
DATE 2005-03-25
Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.

3.3.3 Horizontal scanning

Sync polarity	: Positive or Negative
Scanning frequency	: 30 - 130 KHz
Retrace time	: 1.6 usec (typical)

3.3.4 Vertical scanning

Sync polarity	: Positive or Negative
Scanning frequency	: 50 - 160 Hz

3.4 Power input connection

Power cord length	: 1.8 M
Power cord type	: 3 leads detachable power cord with protective earth plug.

3.5 Video amplifiers

Rise time/Fall time : 4.0 / 4.0 ns
(excluding rise/fall time due to test pattern & test probe)
Overshoot/undershoot : Max. 12%
Black level shift : Max. 3%
Sag : Max. 5%

3.6 Degaussing

An automatic degaussing circuit is provided and required no intervention.The degaussing is activated at the time of switch-on and power saving wake up or switch-on again after switched-off for longer than 30 minutes.Manual degaussing is provided to eliminate any color impurity.

3.7 Requirement for low emission

(1) Electro static potential : < ± 0.5 KV

(2) Alternating Elec. field

ELF 5 - 2 Khz : <= 10.0 V/M
VLF 2 - 400 KHz : <= 1.0 V/M

(3) Magnetic field

ELF 5 - 2 Khz : <= 200 nT
VLF 2 - 400 Khz : <= 25 nT

3.8 Power management

The power consumption and the status indication of the set with power management function are as follows,

STATUS	Horizontal	Vertical	Power Spec	LED
On	Pulse	Pulse	as normal on	Green
OFF	No Pulse	Pulse	< 1 W	Yellow
OFF	Pulse	No Pulse	< 1 W	Yellow
OFF	No Pulse	No Pulse	< 1 W	Yellow

Entering from ON state to Power saving state has 5 - 10 second time delay. It awake from OFF state to On state within 3 seconds.
Compliant with TCO99 / TCO03 power saving requirement EPA energy star requirement E2000

3.9 Display identification

In accordance with VESA Display Channel Standard and having DDC 2B capability

4.0 Visual characteristics

GENERAL PRODUCT SPECIFICATION

PHILIPS

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

(1) Input signal: As defined in 3.1

(2) Luminance setting: controls to be set to 20 ft-lb with full screen 100 % duty cycle white signal.

(3) Warm up: more than 30 minutes after power on with signal supplied.

(4) Ambient light: 400 -- 600 lux.

(5) Ambient temperature: 23 °C

(6) Ambient magnetic field: no special ambient magnetic field existed. (the ac leakage flux, dc flux caused by transformer magnet, etc.)

(7) CRT face: East

4.2 Resolution

Inspection modes (9 modes):

Mode	Resolution	H. freq. / V. freq	Standard
1.	1024 x 768	60.023Khz/75.029Hz	(VESA/75)
2.	1024 x 768	68.677Khz/84.997Hz	(VESA/85)
3.	1280 x 1024	79.976Khz/75.024Hz	(VESA/75)
4.	1280 x 1024	91.146Khz/85.024Hz	(VESA/85)
5.	1600 x 1200	93.75Khz/75.000Hz	(VESA/75)
6.	1600 x 1200	106.25Khz/85.000Hz	(VESA/85)
7.	1792 x 1344	106.3Khz/75.000Hz	(VESA/75)
8.	1920 x 1440	112.5Khz/75.000Hz	(VESA/75)
9.	1920 x 1440	128.5Khz/85.000Hz	

4.3 Brightness

Color Temp	Brightness control	Contrast control	White Square (see fig-5)	Full white
	CENTER	MIN		0 FL
@9300°K	CENTER	MAX	≧32 FL	≧30 FL
@6500°K	CENTER	MAX	≧28 FL	
@5500°K	CENTER	MAX	≧25 FL	

4.3.1 sRGB
Once press " sRGB " function on OSD, the luminance shall be changed to 23+4/-3ft-lb and color temperature is matching to 6500 °K, at white square pattern.

4.4 Flagwaving - jitter Less than 0.15 mm.

4.5 Image size

4.5.1 Actual display size
The dimensions of the data area, measured along the picture center of horizontal and vertical axis of the screen, are listed below: (see FIG-1) (392 ± 4 mm) x (294 ± 4 mm)

4.5.2 Max scan size
Maximum active video size should be not smaller than mask opening. The mask opening is 406.4 x 304.8 mm.

4.6 Image centering deviation
| A-B | and | C-D | <= 6 mm, please see FIG-2

4.7 Picture shift range
H-shift range : total > 30 mm.
V-shift range : total > 15 mm.

4.8 Display dimension stability

Due to brightness	: 1.0 %
Due to aging	: 1.0 %
Due to mains voltage	: 1.0 %
Dynamic	: < 1mm

4.9 Geometric distortions
Pincushion, trapezoid, parallelogram, rotation and other various distortions must remain within the limits to tolerance as in FIG-4.

top/ bottom/left/ right	: 2.0 mm Max.
top plus bottom / left plus right	: 3.2 mm Max.
waviness	: 1.5mm/ 50mm Max.
slope change (Max)	: 1mm Max.

4.10 Picture tilt
± 1mm (see FIG-3)
User adjust range for tilt : 0.5 ° Max.

4.11 Image non-linearity

Horizontal:

$$\frac{\text{Max. - Min.}}{\text{Max. + Min.}} \times 100\ \%$$

<= 8 % (30 - 31.5 KHz)
<= 7 % (31.5 - 64 KHz)
<= 6 % (64 - 130 KHz)

For any two adjacent blocks
<= 5 % (30 - 31.5 KHz)
<= 4 % (31.5 - 64 KHz)
<= 4 % (64 - 130 KHz)

Vertical : <= 5 %
For any two adjacent blocks <= 3 %

4.12 Mis-convergence

The maximum convergence error should be measured on a white line and represents the maximum distance between the center of the red, green and blue lines over the whole image area.

Max. mis-convergence :
(Picture area 392mm x 294mm See FIG-6)

Zone	From 31.5Khz to 64Khz	From 64Khz to 130Khz (without 94Khz)	94Khz
B	<=0.35	<=0.35	<= 0.35
A	<=0.25	<=0.25	<=0.25

4.13 Focus check
First, adjust brightness to 50 % position and contrast to100% position, and then generate "ME" characters for 1280 x 1024 / 85Hz or 1600 x 1200 / 85Hz timings to cover entire picture area (picture size is shown in sect. 4.5). Characters should be clearly identified at the center and all corners. Character size is shown in FIG-7.

4.14 Brightness uniformity
With an active full area white video input pattern and contrast setting to 100%, no portion of the pattern shall be less than 75 % of the luminance measured at the CRT center.

GENERAL PRODUCT SPECIFICATION

4.15 White color adjustment

Apply full white pattern, with brightness in 50 % position and the contrast control at max. position.
The 1931 CIE Chromaticity (color triangle) diagram (x, y) coordinate for the screen center should be:

Factory preset color mode:

9300 °K CIE coordinates	X = 0.283 ± 0.015
	Y = 0.297 ± 0.015
6500 °K CIE coordinates	X = 0.313 ± 0.015
	Y = 0.329 ± 0.015
5500 °K CIE coordinates	X = 0.332 ± 0.015
	Y = 0.347 ± 0.015
sRGB CIE coordinates	X = 0.313 ± 0.015
	Y = 0.329 ± 0.015

Smart color mode:

9300 °K CIE coordinates	x = 0.283 ± 0.025
	y = 0.297 ± 0.025
6500 °K CIE coordinates	x = 0.313 ± 0.025
	y = 0.329 ± 0.025
5500 °K CIE coordinates	x = 0.332 ± 0.025
	y = 0.347 ± 0.025

4.16 White uniformity
Set the brightness control at center 50 % position, then adjust the contrastcontrol to set the luminance at the center of the screen to 100% max.. The color coordinate at any point on the screen should be:

X = X (center) ± 0.015
Y = Y (center) ± 0.015

4.17 Color tracking on full white pattern
Adjust the contrast control from max. to min.(with brightness at click position). The color coordinates should not deviate more than:

x = x (center) +/- 0.015
y = y (center) +/- 0.015

4.18 Purity

Conditions: With full color pattern, with brightness control at 50 % position and contrast control in maximum, under the specific destinations of earth magnetic environments.

After a warm-up time of 30 min., the purity control can be used to eliminate colored stains if it occurs, the monitor should be well degaussed before purity adjustment.

Remark: If the external degaussing is used, the degaussing coil should be a stick type, To set the electrical current of the N/S coil (if exist) equal to zero, or switch off the monitor before external degaussing.

4.19 Moire
At 15FL contrast & moire is acceptable if not over 1/3 area.

4.20 Ringing
Apply a full white pattern at 128.5KHz, set horizontal raster symmetrically by raster shift press the OSD button & select "horizontal position" shift the image to the left edge of the raster. the yoke ring should less than 20mm.

4.21 Tapping test
No interference does disturb the monitor picture during tapping test with a rubber hammer.

4.22 Distance between two monitors
Two monitors of the same monitor type which were conducted with different Modes or frequencies, don't show any interference in a distance down to 25cm.

5.0 Mechanical characteristics

5.1 Controls

Front side :
- AC power switch
- OSD function key

Rear :
- D- sub / BNC
- Power cord socket

5.2 Unit dimension / Weight

REF. TO SHEET 560

5.3 Tilt and swivel base

REF. TO SHEET 191

5.4 Transportation packages

REF. TO SHEET 560

6.0 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur be tween external environment and the display device.

6.1 Susceptibility of display to external environment
Operating
- Temperature : 5 to 35 degree C
- Humidity : 10 to 90% (w/o condensation)
- Altitude : 8,000 ft

Storage
- Temperature : -40 to 60 degree C
- Humidity : 5 to 95% (w/o condensation)
- Altitude : 39,000 ft
- Condensation : should be prevente

6.2 Transportation tests

TEST ITEM	STANDARD	ALL REGIONS MODEL EXCEPT CHINA & INDIA CRT Monitor	CHINA & INDIA MODEL CRT Monitor
A. PACKAGING TEST			
1.Transportation definition		Single transport direction	Single transport direction
2.Transportation test (Vibration + drop)		Yes	Yes

GENERAL PRODUCT SPECIFICATION

2.1.1 Sine Vibration:	acc. To UAN-D1534/01 7 Hz, 1.05 G, 30 min. Transport direction only	Yes	N/A
2.1.2 Random Vibration:	acc. To ASTM-D4169 0.73 Grms, truck spectrum, 30 min/axis, 3 axes.	N/A	Yes
2.2 Drop: (room temperature)	2.2.1acc. To NSTA - Drop sequence: 1Corner-3Edges-6Faces - Drop height: acc. To gross weight	N/A	N/A
	2.2.2 acc. To UAN-D1534/01 - Drop sequence: 6Faces-1Corner-3Edges - Drop height:	Drop height see UAN-D1534/01	N/A
	2.2.3 acc. To NSTA up one level - Drop sequence: 1Corner-3Edges-6Faces - Drop height: acc. To gross weight	N/A	Gross weight : drop height 1 ~ 9.52 Kg 36"(91.4 cm) 9.53 ~ 18.59 Kg 30"(76.2 cm) 18.6 ~ 27.66 Kg 24"(61 cm) 27.67~ 45.36 Kg 18"(45.7 cm)
3. Cold drop testing: for design reference only -10 C, 16 Hrs duration	3.1.1acc. To NSTA - Drop sequence: 1Corner-3Edges-6Faces - Drop height: acc. To gross weight	N/A	N/A
	3.1.2 acc. To UAN-D1534/01 - Drop sequence: 6Faces-1Corner-3Edges - Drop height:	Drop height see UAN-D1534/01	N/A
	3.1.3 acc. To NSTA up one level - Drop sequence: 1Corner-3Edges-6Faces - Drop height: acc. To gross weight	N/A	Gross weight : drop height 1~ 9.52 Kg 36"(91.4 cm) 9.53 ~ 18.59 Kg 30"(76.2 cm) 18.6 ~ 27.66 Kg 24"(61 cm) 27.67~ 45.36 Kg 18"(45.7 cm)
B. UN-PACKAGING TEST			
1. Sine vibration-operating:	1.1 acc to UAN-D636 10-55-10 Hz, 0.35 mm Ampl. 30 min/axis, 3 axes.	N/A	Yes
2. Half sine Shock-non-oper.	2.1 acc. To UAN-D636 30 G, 18 msec, 6 shocks	N/A	N/A
	2.2 acc. To OEM spec. 120 G, <3 ms, 6 shock exclude CRT impurity	N/A	Yes

PHILIPS

6.3 Display disturbances from external environment According to IEC 61000-4-2 ESD disturbances

6.4 Display disturbances to external environment

6.4.1 Ionizatic radiation
Completely fulfilled International Commission of Radiological Protection (ICRP) requirement 0.5 mR/hrs.

7.0 Reliability

7.1 Mean Time Between Failures
MTBF should be calculated according to military standard MIL-HDBK-217C. MTBF > = 75,000 hrs (excluding CRT)

$$\text{Practice of MTBF} = \frac{\text{Total hrs (power on) x Total sets}}{\text{NO. of failed sets}}$$

8.0 Quality assurance requirements

8.1 Acceptance test
according to MIL-STD-105D Control II level

AQL : 0.65 (major)
2.50 (minor)
(please also refer to annual quality agreement)
Customer acceptance criteria : UAW0377/00

9.0 Serviceability
The serviceability of this monitor must be fulfill the requirement which are prescribed in UAW-0346 and must be checked with the check list UAT-0361.

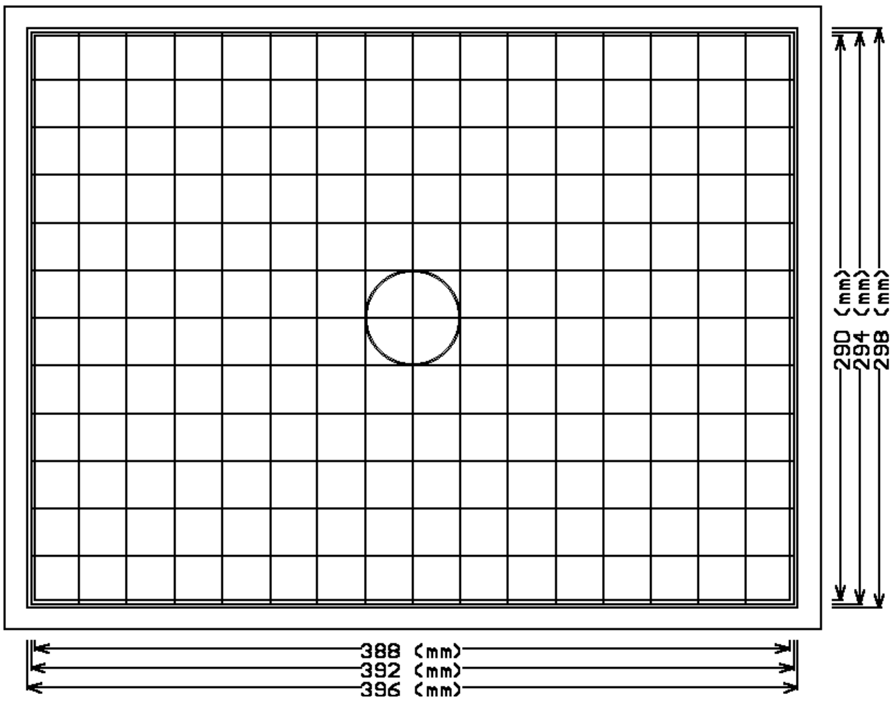
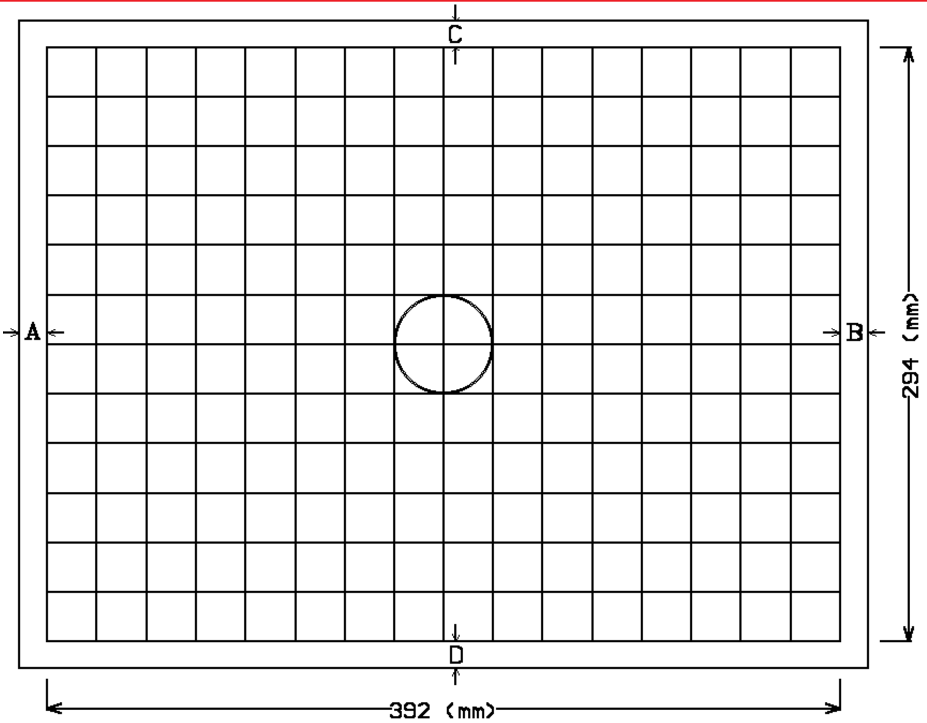


FIG-1 IMAGE DEMENSION

GENERAL PRODUCT SPECIFICATION



| A-B | and | C-D | < 6mm

FIG-2 IMAGE CENTERING

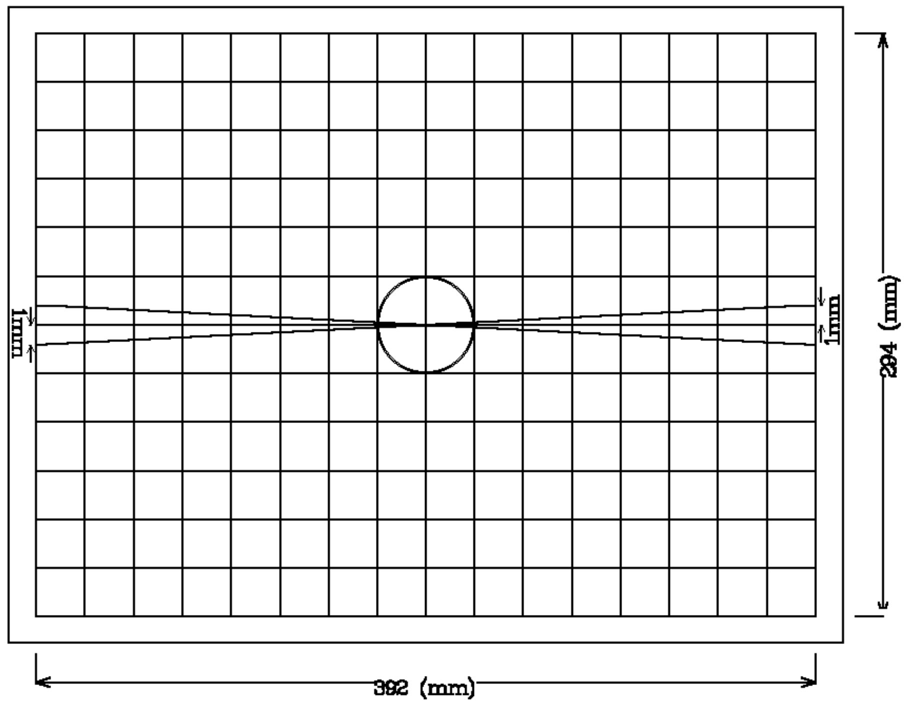
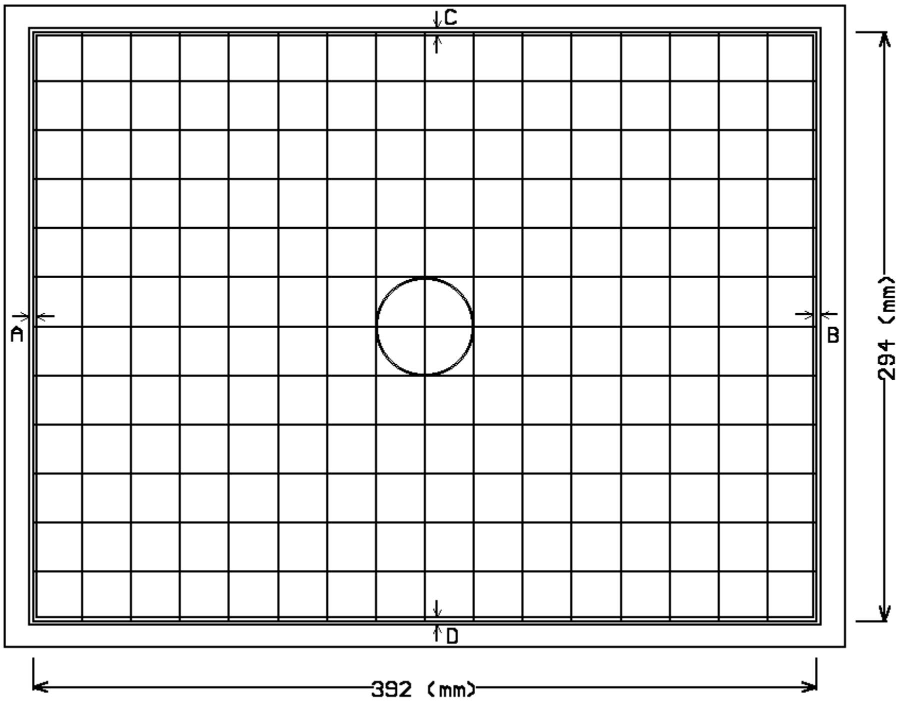


FIG-3 IMAGE ROTATION

CLASS NO.	21"AUTO SCAN CMTR-P72-202P7 TYPE : 202P70/00 BRAND : PHILIPS	8639 000 16171	
2005-03-25			
NAME C.C. Liao	SUPERS. 21	590 — 17	10 A4
TY CHECK	DATE 2005-03-25	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	



A = B = C =D =2.5 mm

FIG-4 IMAGE GEOMETRY

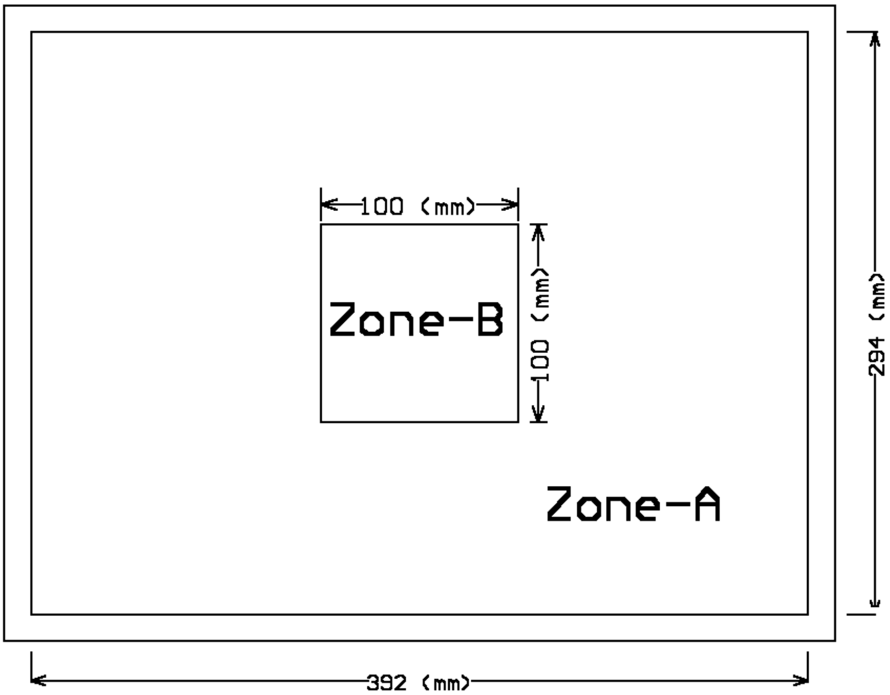


FIG-5 BRIGHTNESS AND CONTRAST MEASUREMENT AREA

GENERAL PRODUCT SPECIFICATION

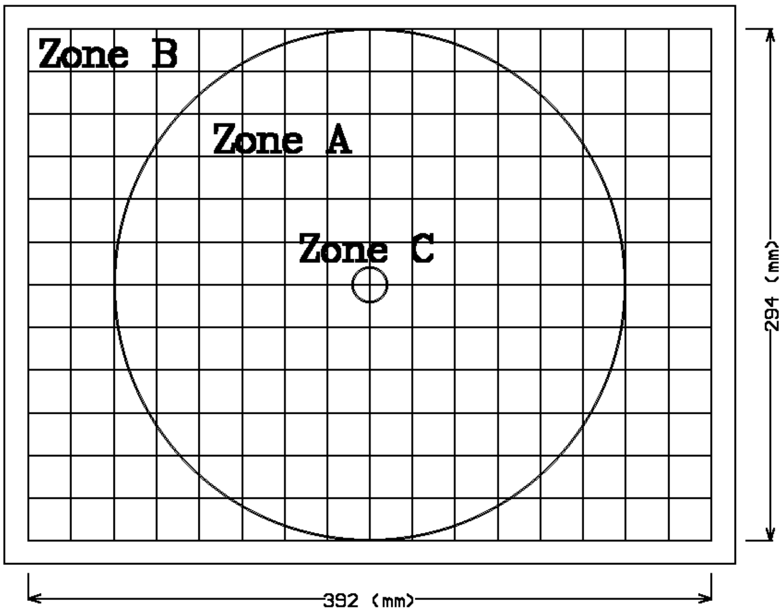


FIG-6 MISCONVERGENCE

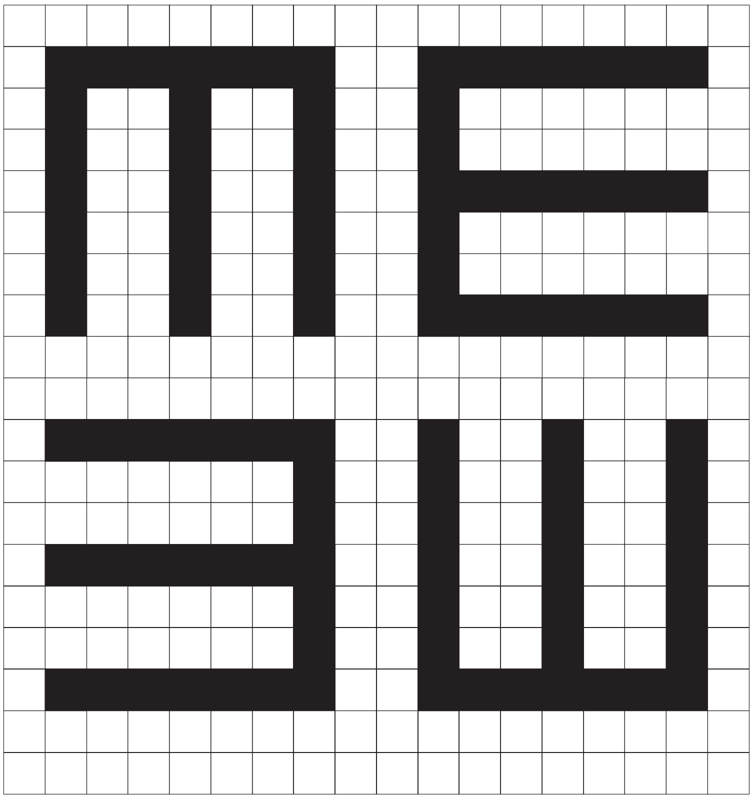


FIG-7 SYMBOL FORMAT FOR FOCUS CHECK

CLASS NO.	21"AUTO SCAN CMTR-P72-202P7 TYPE : 202P70/00 BRAND : PHILIPS	8639 000 16171
2005-03-25		
NAME C.C. Liao	SUPERS. 21	590 — 19 10 A4
TY CHECK	DATE 2005-03-25	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.

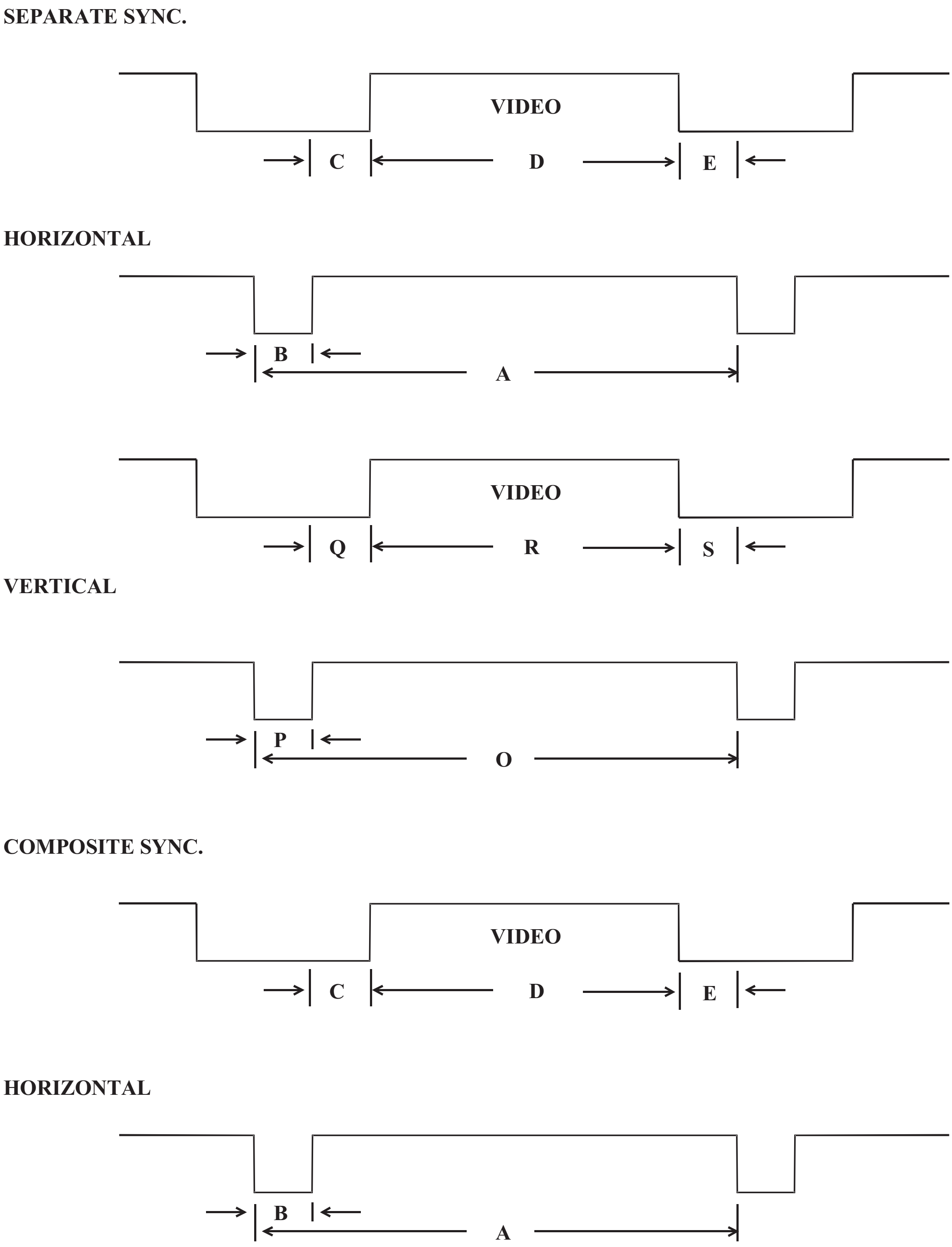


FIG-8 TIMING CHART -1

GENERAL PRODUCT SPECIFICATION

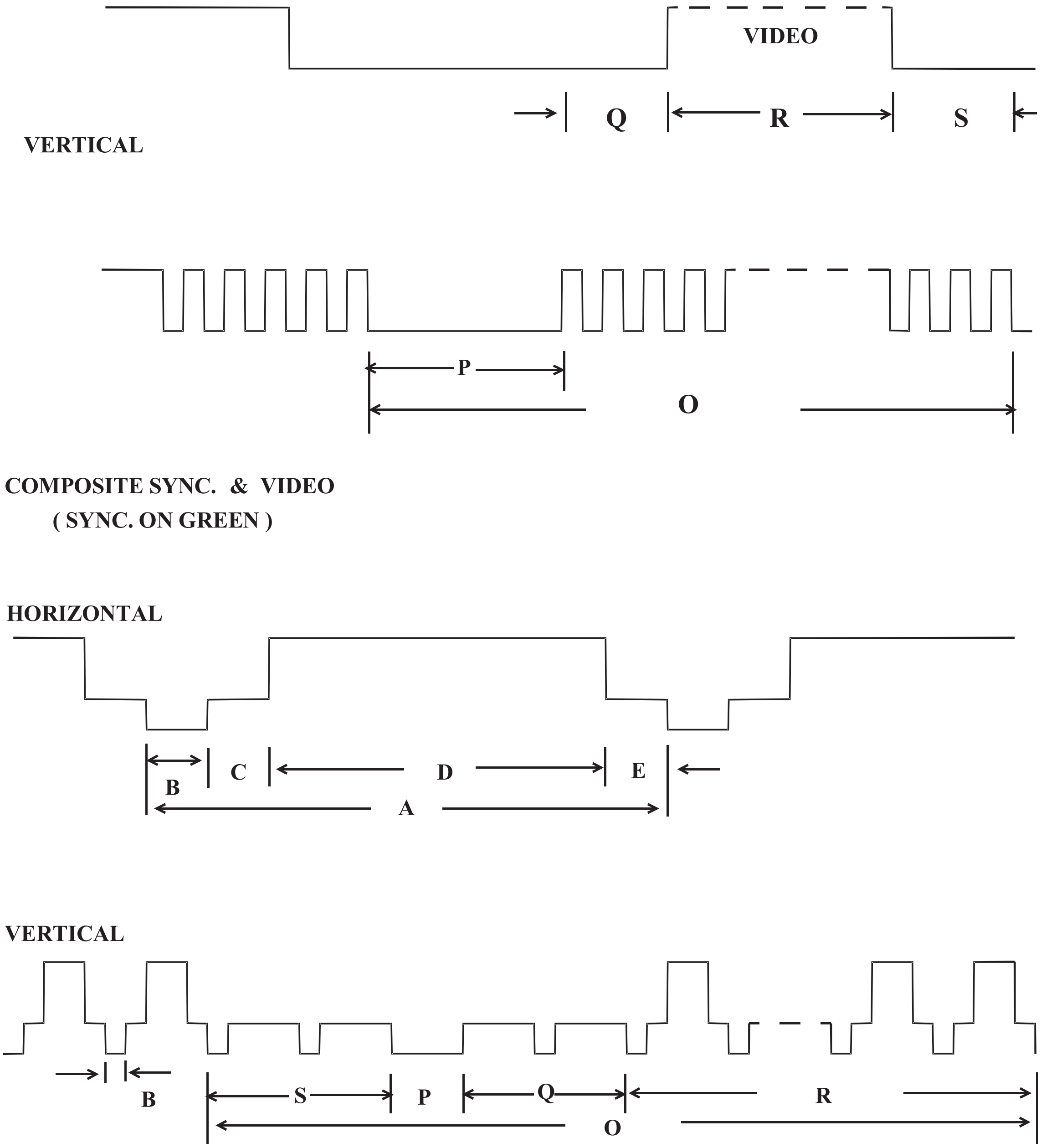


FIG-9 TIMING CHART -2

CLASS NO.	21"AUTO SCAN CMTR-P72-202P7 TYPE : 202P70/00 BRAND : PHILIPS	8639 000 16171	
2005-03-25			
NAME C.C. Liao	SUPERS. 21	590 — 21	10 A4
TY CHECK	DATE 2005-03-25	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	

White Balance Adjustment

Alignment procedure

1. Turn on 202P7 CRT monitor.

2. Turn on the Timing/Pattern generator.
Setting generator to provide CROSS-Hatch pattern at
Resolution :1280*1024
Timing : H= 68.7kHz V= 85 Hz

3. Preset CRT colour Analyzer CA-100
- Remove the lens protective cover of probe CA-100.
- Set Measuring/viewing selector to Measuring position for reset analyzer.
- Turn on the colour analyzer (CA-110).
- Press 0-CAL button to starting reset analyzer.

4. Access Factory Mode
1). Turn off monitor(don't turn off PC)

2). Press and simultaneously on the front control pane, then press , wait until the OSD menu with characters "P72 FAMILY V0.10 20050104"(below OSD menu) come on the screen of monitor.Press button to bring up OSD MENU for confimation.



Factory Mode------------- Indicator

Note: after alignment, please reset OSD to user's mode for normal operation. Otherwise, the monitor won't entering power saving mode and showing full white picture all the time as no video signal supplied. To leave factory mode by restart the monitor.

5. All voltages are to be measured or applied with respect to ground, unless otherwise stated.
Note: Do not use heat sinks as ground

6. Any external voltage sources should have a low internal impedance.

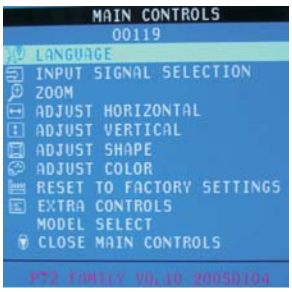
7. Adjust brightness controls to center position except for contrast control which should be set to max.

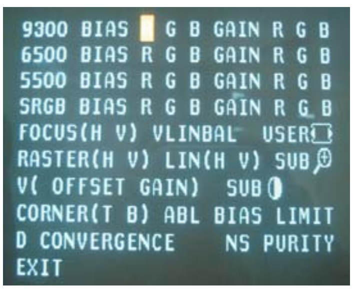
8. The white balance and purity has to be adjusted in dully lighted room.

9. All alignments have to be done in a room with a temperature of 25 +/- 5°C.

10. Setting pattern to full white picture.

11. Press then select "P72 FAMILY V0.10 20050104",by button ,then press to enter the following picture.





12. Press , and buttons to adjust the monitors.

13. Factory preset color mode (B)

X (center) = 0.283 ± 0.013 for 9300 °K
Y (center) = 0.297 ± 0.013

X (center) = 0.313 ± 0.013 for 6500 °K
Y (center) = 0.329 ± 0.013

X (center) = 0.332 ± 0.013 for 5500 °K
Y (center) = 0.347 ± 0.013

X (center) = 0.313 ± 0.013 for sRGB
Y (center) = 0.329 ± 0.013

14. Smart color mode (S)

X (center) = 0.380 ± 0.020 for 4000 °K
Y (center) = 0.377 ± 0.020

X (center) = 0.357 ± 0.020 for 4600 °K
Y (center) = 0.362 ± 0.020

X (center) = 0.332 ± 0.020 for 5500 °K
Y (center) = 0.347 ± 0.020

X (center) = 0.313 ± 0.020 for 6500 °K
Y (center) = 0.329 ± 0.020

X (center) = 0.295 ± 0.020 for 8000 °K
Y (center) = 0.304 ± 0.020

X (center) = 0.283 ± 0.020 for 9300 °K
Y (center) = 0.297 ± 0.020

Alignment hits: 1. R for x value, G for y value, B for Y value on the colour analyzer.
2. If the colour analyzer has been calibrated and preset colour temperature in it. Please switch to correct setting in accordance with colour settings.

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Repair Tips

0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential !

1. Servicing of SMDs (Surface Mounted Devices)

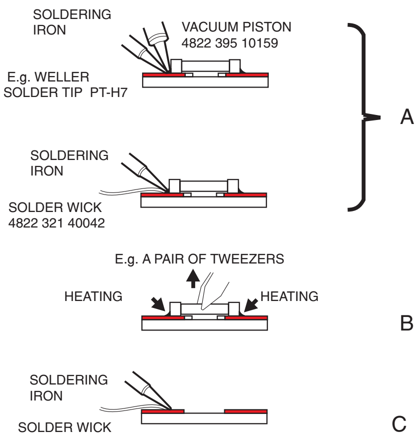
1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



- While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).
- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

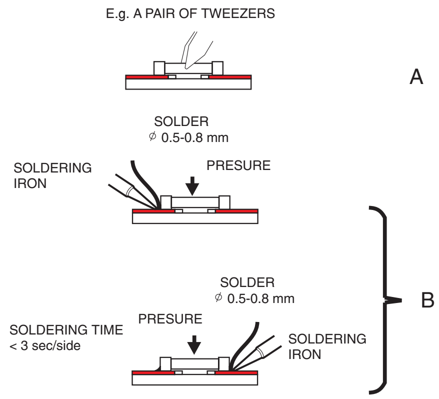
1.3 Caution on removal

- When handling the soldering.iron. use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should Preferably be equipped with a thermal control (soldering temperature: 225 degree V to 250 degree C.
-The chip, once removed, must never be reused.

1.4 Attachment of SMDs

-Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig. 2A)
-Next complete the soldering of the terminals of the component. (See Fig. 2B)

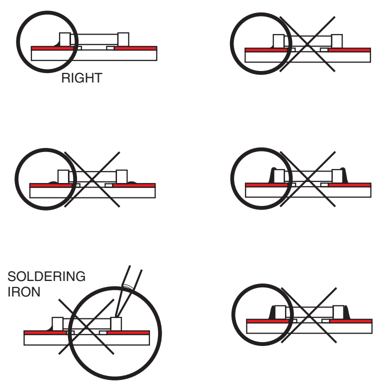
Fig. 2 MONUTING



2. Caution when attaching SMDs

- When soldering the SMDs terminals, do not touch them directly with the soldering iron. The soldering should be directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30W) should preferably be equipped with a thermal control (soldering temperature: 225 degree C to 250 degree C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMDs cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (See Fig. 3).

Fig. 3 Examples



All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both *Hipot* and *Ground Continuity* testing.

HI-POT TEST INSTRUCTION

1.Application requirements

1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.
1.2 This test must be performed again after the covers have been refitted following the repair, inspection or modification of the product.

2. Test method

2.1 Connecting conditions

2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.
2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements
All products should be HiPot and Ground Continuity tested as follows:

Condition	HiPot Test for products where the mains input range is Full range(or 220V AC)	HiPot Test for products where the mains input is 110V AC(USA type)	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A,AC Test time: 3 seconds(min.) Resistance required: <=0.09+Rohm, R is the resistance of the mains cord.
Test time (min.)	3 seconds	1 second	
Trip current (Tester)	set at 100 uA for Max. limitation; set at 0.1 uA for Min. Limitation	5 mA	
Ramp time (Tester)	set at 2 seconds		

2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.

2.2.2 The test voltage must be maintained within the specified voltage + 5%.

2.2.3 There must be no breakdown during the test.

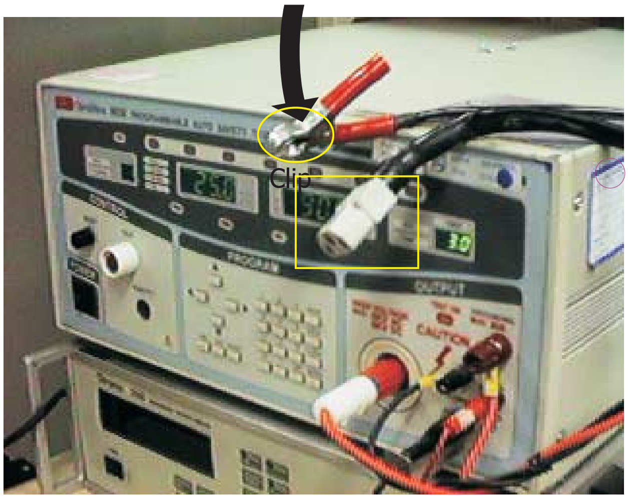
2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

3.1. Equipments
For example :
- ChenHwa 9032 PROGRAMMABLE AUTO SAFETY TESTER
- ChenHwa 510B Digital Grounding Continuity Tester
- ChenHwa 901 (AC Hi-pot test), 902 (AC, DC Hi-pot test) Withstanding Tester

3.2. Connection
* Turn on the power switch of monitor before Hipot and Ground Continuity testing.

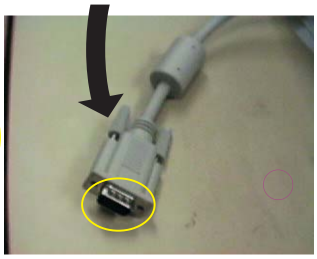
Clip



(ChenHwa 9032 tester)

Video cable

Connect the "video cable" or "grounding screw" to the CLIP on your tester.



Grounding screw



Connect the power cord to the monitor.

Power outlet

(Rear view of monitor)

4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.

Waring and Notes

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Warnings

1. Safety regulations require that the unit should be returned in its original condition and that components identical to the original components are used. The safety components are indicated by the symbol ⚠ .

2. In order to prevent damage to ICs and transistors, all high-voltage flash-overs must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0 V (after approximately 30 seconds).

3. ESD
All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten their life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the ground of the unit. Keep components and tools also at this same potential.

4. When repairing a unit, always connect it to the AC Power voltage via an isolating transformer.

5. Be careful when taking measurements in the high-voltage section and on the picture tube panel.

6. It is recommended that saferty goggles be worn when replacing the picture tube.

7. When making adjustments,use plastic rather than metal tools. This will prevent any short-circuit or the danger of a circuit becoming unstable.

8. Never replace modules or other components while the unit is switched on.

9. Together with the defleciton unit, the picture tube is used as an integrated unit. Adjustment of this unit during repair is not recommended.

10. After repair, the wiring should be fastened in place with the cable clamps.

11. All units that are returned for service or repair must pass the original manufactures safety tests.

Notes

1. The direct voltages and waveforms are average voltages. They have been measured using the Service test software and under the following conditions :
   - Mode : 1024*768 (60kHz /75Hz)
   - Signal pattern : White pattern
   - Adjust brightness and contrast control for the mechanical mid-position (click position)

2. The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.

3. The semiconductors indicated in the circuit diagram(s) and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

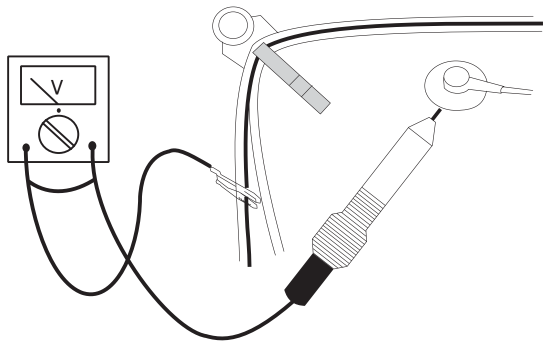


Fig.1

Diversity of 202P73/27 compared with 202P70/00

Item	12NC	Description
	863900016175	202P73/27
0001	313812755251	FRONT CABINET ASSY
0002	313812755281	BACK COVER ASSY
0003	313812753161	PEDESTAL ASSY(BLK)
0041	313810463111	FRONT CABINET
0042	313810459321	BACK COVER(BLK)
0044	313810459342	BASE (BLK)
0049	313810459281	SCREW COVER(BLK)
0051	313810463121	REAR COVER
0053	313810459352	SWIVEL(BLK)
0222	313811578981	LABEL-CPU(DRIVER)
0450	313810663841	CARTON
1057	313818870491	MAINSCORD UL 10A 1M8 DET BK
1058	313819870611	CORD SUB-D 15/1M8/15 D-SUB BK
1061	313818873431	COI DEGAUS TDC196

Diversity of 202P75/93 compared with 202P70/00

Item	12NC	Description
	863900016415	202P75/93
0001	313812755291	FRONT CABINET ASSY
0002	313812755281	BACK COVER ASSY
0003	313812753161	PEDESTAL ASSY(BLK)
0041	313810463111	FRONT CABINET
0042	313810459321	BACK COVER(BLK)
0044	313810459342	BASE (BLK)
0049	313810459281	SCREW COVER(BLK)
0051	313810463121	REAR COVER
0053	313810459352	SWIVEL(BLK)
0222	313811578981	LABEL-CPU(DRIVER)
1051	313817881671	MAIN PCB ASSY (P72-450V)
1057	313818871651	MAINSCORD CCEE 10A 1M8 DET BK
1058	313819870611	CORD SUB-D 15/1M8/15 D-SUB BK
1061	313818873431	COI DEGAUS TDC196
1264	313817807091	BRIDGE ASSY(6101-GBU6J)
2103	202203100246	ELCAP PL 450V S 330U PM20 B

Diversity of 202P75/97 compared with 202P70/00

Item	12NC	Description
	863900016493	202P75/97
0001	313812755291	FRONT CABINET ASSY
0002	313812755281	BACK COVER ASSY
0003	313812753161	PEDESTAL ASSY(BLK)
0024	313810133753	BOTTOM PLATE
0031	313810798971	HEAT SINK ASSY
0032	313810798541	HEAT SINK ASSY
0033	313810798531	HEAT SINK ASSY
0034	313810798551	HEAT SINK ASSY
0035	313810798611	HEAT SINK ASSY
0041	313810463111	FRONT CABINET
0042	313810459321	BACK COVER(BLK)
0044	313810459342	BASE (BLK)
0049	313810459281	SCREW COVER(BLK)
0050	313810322552	ISULATING PLATE
0051	313810463121	REAR COVER
0053	313810459352	SWIVEL(BLK)
0055	313810449831	POWER LEVEL
0068	313810168161	ALU. FOIL (WXH=50X18MM)
0072	313810133101	METAL SHIELD-RIGHT
0074	313810134351	METAL SHIELD-LEFT
0076	313810321241	INSULATING PLATE
0076	313810133222	BRACKET-MHR
0077	313810134252	FRONT SHIELDING
0079	313810321731	INSULATING PLATE (16X31)
0081	313810164391	CLIP
0086	313810132581	CLIP-R
0092	313810132012	HEAT SINK
0093	313810132221	HEAT SINK
0094	313810132231	HEAT SINK
0095	313810132621	HEAT SINK
0096	313810132241	HEAT SINK
0098	313810163071	HEAT SINK
0099	313810132511	HEAT SINK
0099	313810165661	HEAT SINK
0100	313810132041	HEST SINK
0107	313810414131	WIRE SADDLE
0178	313810541153	QUICK SETUP GUIDE-BOOKLET
0222	313811578981	LABEL-CPU(DRIVER)
0300	313810165401	CLIP
0301	313810165401	CLIP
0302	313810165401	CLIP
0306	313810132591	CLIP-L
0311	313810340032	INSULATION PLATE
0316	313810129841	HEAT SINK
0322	252240189008	NUT HEX ST BLK M3
0324	252240189008	NUT HEX ST BLK M3
0325	252240189008	NUT HEX ST BLK M3
0326	252240189008	NUT HEX ST BLK M3
0345	130750001601	ADHESIVE RTV732 (DOW CORNING)
0346	130750001601	ADHESIVE RTV732 (DOW CORNING)
0347	130750001601	ADHESIVE RTV732 (DOW CORNING)
0393	313810128401	HEAT SINK AUDIO
0601	313811707745	E-D.F.U. ASSY
0602	313811707755	E-D.F.U.
1057	313818871672	MAINSCORD UK 10A 1M8 DET BK
1058	313819870611	CORD SUB-D 15/1M8/15 D-SUB BK
1061	313818873431	COI DEGAUS TDC196
1201	243803100068	CON V 9P M 2.50 625/635 B
1205	242202519051	CON V 3P M 2.50 63423 B
1206	242202519004	CON V 4P M 2.50 64184 B
1250	313817860841	HOR. TRANS ASSY 6518/7502
1251	313817806981	VERT IC ASSY(7567-STV9379)
1252	313817859861	BUCK CON ASSY(7541-IRF730)
1253	313817881241	EHT ASSY (U3)
1254	313817807021	12V REG ASSY(7363-L7812)
1255	313817807031	S-CAP MOSFET ASSY(7622-SLA5058
1256	313817861941	POW O/P ASSY(7121)
1257	313817881201	DIODE ASSY(6672-31DF6/8E)
1263	313817807081	8V REG ASSY(7364-L7808)
1264	313817807091	BRIDGE ASSY(6101-GBU6J)
1271	313817867331	IC ASSY(LM2412-7705)
1273	313817853351	CERC CAP+CORE ASSY-2763
1274	313817853361	CERC CAP+CORE ASSY-2765
1275	313817861901	CERC CAP+CORE ASSY(2764)
1703	243803201009	CON 1P 1.54 DIA B
1705	243803100056	CON H 10P M 2.50 625/626 B
1706	243803100057	CON H 11P M 2.50 625/626 B
1711	242250080083	SOC CRT V 9P F 12P 14-17KV Y
1712	313818876632	CON BM V 1P F 63200
1796	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1797	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1798	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1799	313816879171	FERRITE CORE C8BRH 3.5X3.2X1

TELEVISION/MONITOR SAFFTY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected,a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition,which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barries, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints,solder splashes,sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord).Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout,lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with ans by the Ref. No. in the parts list and enclosed within a broken line * (where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug.) Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also check all metal control shafts(with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safety operated without danger of electrical shock.

* Broken line

Implosion

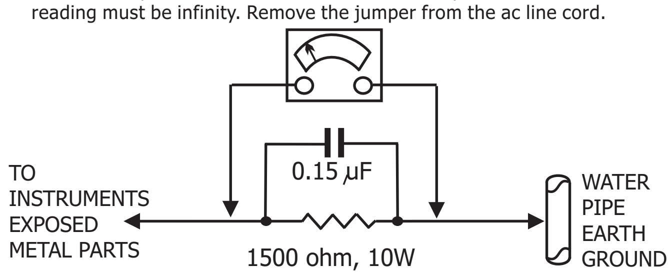
1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn,whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an x-radiation problem. High voltage should always be kept at the manufacturer's rated value-no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do
6. New picture tubes are specifically designed to withstand higher operathng voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-diation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed.(Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards

WARNING : Before removing the CRT anode cap, turn the unit **OFF** and short the HIGH VOLTAGE to the CRT DAG ground.
SERVICE NOTE : The CRT DAG is not at chassis ground.